Freight Progress Number

MAY 25, 1940

Railway Age

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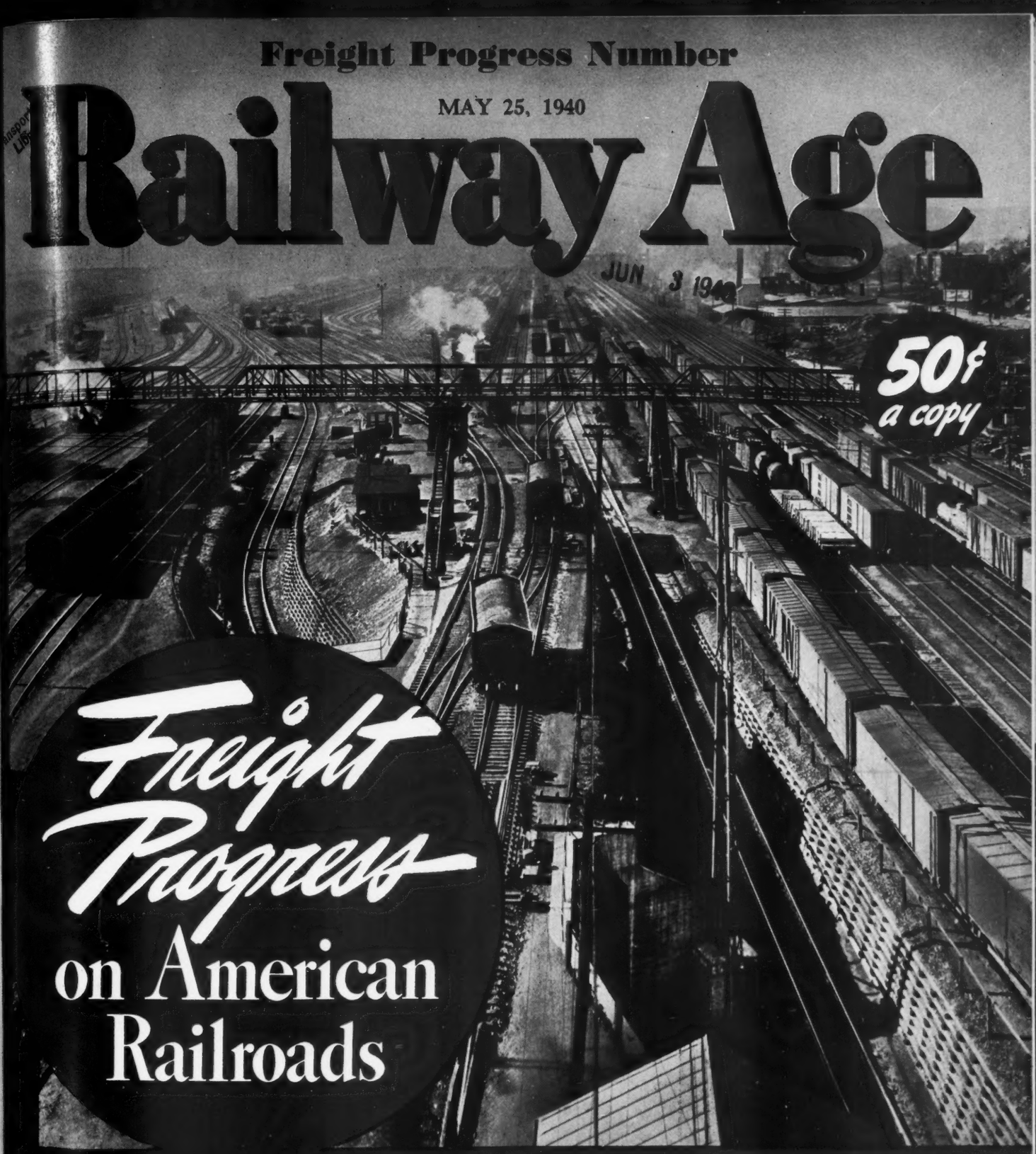

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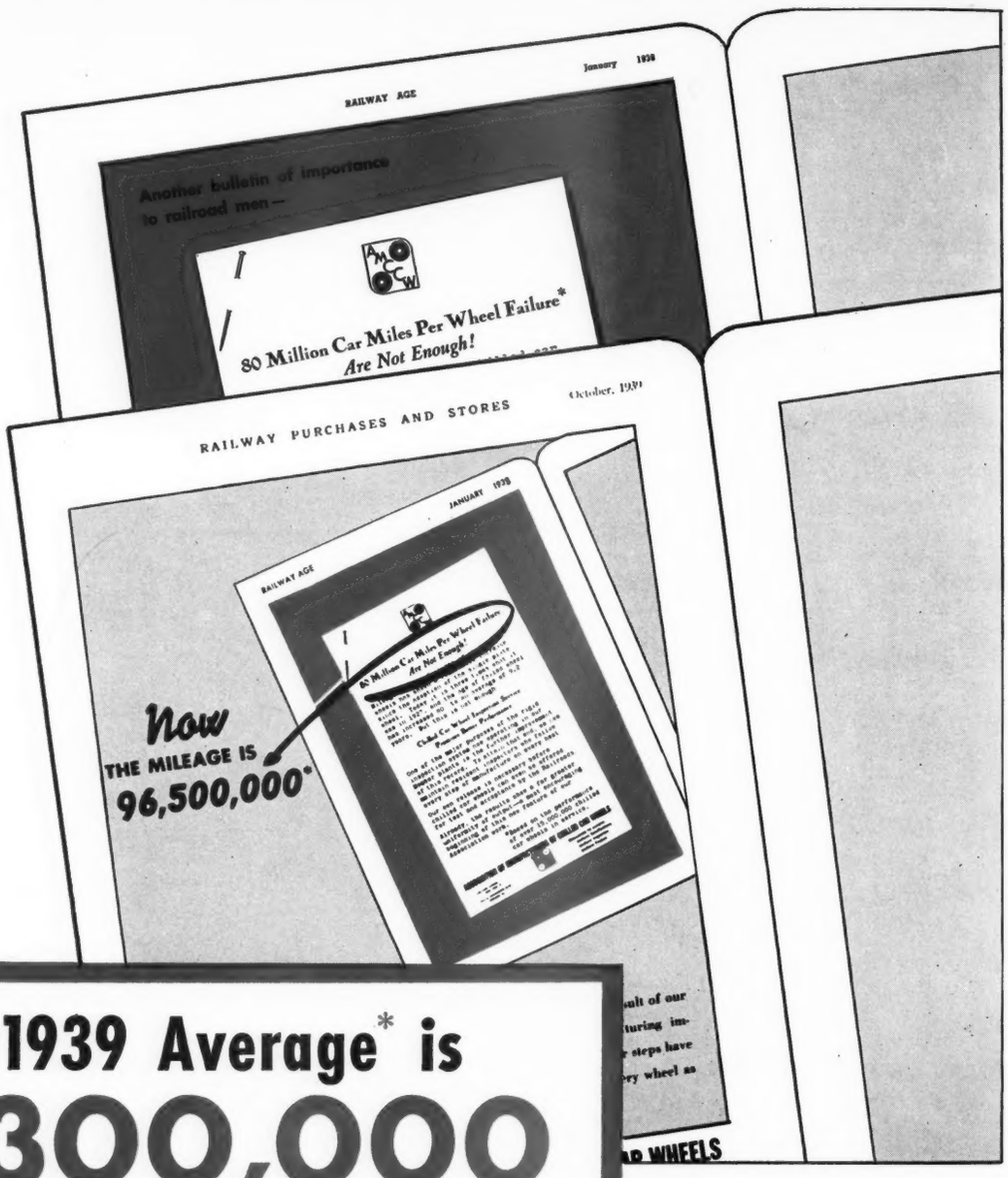

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RAILWAY AGE

The Railways and the Shippers

"Probably the most outstanding single industrial accomplishment since the war has been the re-organization of our American Railroads."
—*Herbert Hoover, 1926.*

In the year 1919 (after the end of the great war) the railways of the United States were operated by the government. They had 2,400,000 freight cars; but during the latter part of that year there was a "car shortage." In 1929 they handled 20 per cent more freight with fewer cars; but there was no car shortage. In 1939 they handled 91 per cent as much freight as in 1919, and as much in the latter part of the year; they had 690,000 fewer cars; but there was no car shortage.

The average speed of trains in 1919 was 10 miles an hour; in 1929, 13.2 miles; in 1939, 16.7 miles.

In 1919 the average number of tons handled per train was 637. In 1929 it was 804. In 1939, in spite of much higher speeds, it was 813.

In 1919 the average wage of railway employees was $1,486; in 1929, $1,744; in 1939, $1,886—27 per cent more than in 1919.

In 1919 railway taxes were only 4½ per cent of gross earnings. In 1929 they were 6.3 per cent; and in 1939 were 9 per cent.

In 1919 the average rate (revenue per ton-mile) that shippers paid the railways was 9.73 mills; in 1929 it was 10.76 mills; and in 1939 it was 9.74 mills—almost exactly the same as in 1919, in spite of much higher wages and taxes.

In 1919, under government operation, there were 1,913,422 railway employees; in 1929, when 20 per cent more freight was handled, 1,660,850; in 1939, when almost as much was handled as in 1919, only 987,943.

In 1919 railway operating expenses were 4 billion 400 million dollars. In 1929, when 20 per cent more freight was handled, they were 4 billion 500 million dollars. In 1939, when traffic was almost equal to that of 1919, they were only 2 billion 900 million dollars—34 per cent less than in 1919 in spite of higher wages.

In 1919 shippers paid the government 3 billion 600 million dollars for their railway freight service. In 1929, under private operation, they paid 4 billion 800 million for it. In 1939 they paid only 3¼ billion dollars for it. Nevertheless, in 1919 the government incurred a large deficit which had to be paid in taxes—in addition to what already had been paid in rates. In 1929 and 1939 there were no deficits for the taxpayers to meet.

Both in 1920 and (at lower prices) in 1929 manufacturers' total sales were about 70 billion dollars. In 1920 their inventories were about 14 billion dollars. In 1929, because of the improvement in railway service, they had become able to reduce them to about 9 billion dollars. The average annual cost of carrying inventories being about 25 per cent, this effected an annual saving to the manufacturing industry alone of about 1¼ billion dollars. During the depression its sales have averaged only about 45 billion; but good railway service has enabled it to keep inventories relatively even lower, with continuing annual savings of probably ¾ of a billion to 1 billion dollars.

All the benefits to industry and commerce from improved railway efficiency and service have aggregated much more than these figures indicate.

Samuel O. Dunn

What is Good Railway Freight Service Worth?

Whatever may have been Herbert Hoover's later success as President, he established a reputation as the greatest Secretary of Commerce the country ever had. None of his predecessors or successors have studied the nation's business so thoroughly, and acquired such a comprehensive knowledge of it, or such a grasp of its major problems. Therefore, he made a profound impression when he said to the Interstate Commerce Commission in February, 1922, "There would be no difficulty whatever, by basing such losses on the experiences we have already had, to calculate a loss to the American people of a billion dollars for each one of these periodic transportation shortages."

At the same time he predicted, "Unless we can have an immediate resumption of (railway) construction and equipment, our commercial community will pay treble the cost of the whole of them in their losses of a single season. The very moment that we reach anything like normal business we shall see a repetition of car shortages, followed by an increase in the cost of coal to the consumer from one to three dollars a ton; we shall again see premiums of 20 cents a bushel for the use of cars for moving grain; we shall in fact see a shortage of commodities to the consumer; and we shall see gluts upon the hands of the producers. We shall see factories filled with orders again closed for lack of cars; we shall see large intermittency in employment; and we shall see the usual profiteering in commodities due to a stricture between the producers."

The Last of "Car Shortages"

This gloomy forecast was soon fulfilled. From the last week in July, 1922, to the middle of May, 1923, shippers' total unfilled orders for freight cars were never less than 25,000 in any week, and reached a maximum of 179,000 in the week ending October 31, 1922.

But that was the last of large "car shortages." Shippers' unfilled orders have never in any week in the subsequent seventeen years exceeded 4000 cars. And Mr. Hoover was to say in the annual report of the Department of Commerce for 1926, "Probably the most outstanding single industrial accomplishment since the war has been the re-organization of our American Railways. * * * The result of this great re-organization upon the whole economic fabric of the country has been far-reaching."

This "re-organization" consisted principally of an investment of 3½ billion dollars in equipment and permanent improvements in the four years 1923-1926, inclusive, and of better arrangements for the distribution, movement, loading and unloading of cars which the railways made during these years in co-operation with the shippers' regional advisory boards that were formed throughout the country. In the eight years ending with 1930 their expenditures for equipment improvements amounted to almost 7 billion dollars; in the sixteen years ending with 1938 to almost 9 billion; and throughout this period, with the co-operation of the shippers, the distribution and movement of cars have continued to be improved and accelerated.

The quotations from Mr. Hoover have been made, and the subsequent developments reviewed, to provide a background for the contents of this issue of the *Railway Age,* which is devoted to the great improvements that the railways have made, and are still making, in their freight service. Human memory is short. Furthermore, many of the shippers who had to meet the transportation conditions of former years have been succeeded by others who did not experience them, and must have that experience recalled to enable them to appreciate present service.

The "Most Outstanding Industrial Accomplishment"

When Mr. Hoover called the achievement of the railways "the most outstanding single industrial accomplishment since the war," the improvement in their service and its effects upon the "whole economic fabric of the country" had only just begun. Between 1920 and 1926 the average speed of trains had only been increased from 10 to 12 miles an hour, or 20 per cent. In 1939 it was almost 17 miles an hour—40 per cent more than in 1926 and 60 per cent more than in 1920.

In the various articles appearing in this issue there are presented at length and in detail the improvements that have been made and how they have been accomplished. In order to achieve and maintain them the railways have had to incur much larger capital and operating costs than would otherwise have been required. Of how much value have they been, and are they now, to shippers and the public?

The depression traffic has been much smaller than that of the prosperous 20s. The years of "car shortages" now seem remote. Consequently, there has been much less said by business men recently than formerly regarding the advantages they are deriving from the improvement in freight service. It is well worth while, therefore, to recall now what they were saying a decade ago.

Business long had been highly prosperous then, and business men keenly realized how much they had been helped to improve their operations and results by the fact that subsequent to 1923 the forebodings of Secretary Hoover had not been realized.

Vast Reduction of Manufacturers' Inventories

In the early part of 1930 George R. Meyercord, then recently president of the Illinois Manufacturers' Association, issued a remarkable statement. The year 1920 was one of serious transportation congestions and delays; 1929, a year of much larger business, had been free from them. Mr. Meyercord made a survey to determine the magnitude of the most important effect of this change—that of enabling business to reduce its inventories. He ascertained that on October 1, 1920, the inventories of Illinois manufacturers—semi-finished and finished products, as well as raw materials—had a value equivalent to 20.2 per cent of their total sales in that year; while on November 1, 1929, they were but 13.23 per cent of sales in that year. Their 1929 sales amounted to 6 billion dollars. Therefore, if in 1929 their inventories had been as large in proportion to

their sales as in 1920, they would have been 1 billion 200 million dollars. But on November 9, 1929, they were only 794 million. Thus, Illinois manufacturers accomplished the equivalent of a reduction of almost 420 million dollars in their inventories, which would have been impossible without the improvement in railway service that had occurred.

The total sales of all United States manufacturers in 1929 were 70 billion. Mr. Meyercord said it was reasonable to assume they had made proportionately as much reduction in their inventories as those of Illinois. On that basis all the country's manufacturers had made between 1920 and 1929 the equivalent of a reduction in their inventories of 5 billion dollars. Experts estimated the annual average cost of carrying inventories at 25 per cent of the investment in them. On that basis, the annual saving to the manufacturers of the country, as a result of a reduction of their inventories made possible by improved transportation, was 1¼ billion dollars.

Saving Business More Than 1 Billion Dollars Annually

The *Railway Age* at about the same time sent a questionnaire to large concerns engaged in almost every line of industry and commerce asking them regarding the benefits that they were deriving from the improvements in railway freight service. There were received one hundred replies, all tending not only to support the remarkable conclusions justified by Mr. Meyercord's estimate, but to show that every branch of industry and commerce was benefiting proportionately, not only through reduction of inventories but in numerous other ways.

Production and commerce have declined. Manufacturers' sales during the depression years have averaged only about 45 billion dollars. The proportion of freight traffic handled by the railways has decreased from 75 to 63 per cent of the total. But they are still the great carriers of commerce. The Interstate Commerce Commission has estimated that all the freight handled by them in 1928 had a value of 68 billion dollars and in 1936 of 63 billion dollars. These gigantic figures indicate that even after the railways have lost a large part of their traffic, and under conditions of depression, there is still loaded for shipment by rail on the average daily freight having a value of 173 million dollars. Obviously the kind of service rendered day after day in transporting goods of such huge value from all shippers to all consignees is a matter of the first economic importance.

Advantages to All Kinds of Business

The advantages being derived by business from the improvement in railway freight service are much the same today as ten years ago. Therefore, as no more recent survey has been made, we publish elsewhere in this issue a summary of what was said then regarding these advantages by leaders in all lines of business ten years ago.

Undoubtedly the greatest benefit has been that of enabling companies and individuals engaged in every kind of business to curtail their inventories. The inventory of the manufacturer consists of the fuel, raw materials and the semi-finished and finished products that he must always carry to be prepared to fill orders promptly. The inventory of the country merchant consists only of the goods on his shelves. But it makes relatively as much difference to the latter as to the former whether he can get adequate, dependable and fast railway transportation. He has capital invested in his inventory—a much larger portion of his total capital than the manufacturer. When he can depend upon goods being delivered to him quickly and when he expects them he can, like the manufacturer, carry a relatively much smaller stock than would otherwise be necessary.

Improved Service During the Depression Years

The huge economic value of the kind of transportation that made "hand-to-mouth buying" possible was fully appreciated by business men a decade ago when it was new to them. But it would be a great mistake to assume it has been during the depression years and is now of relatively less economic value. As advantageous as "hand-to-mouth buying" is in years of prosperity, it is more so during such years as the last ten. For while the last decade has been one of depression, it has also been one of relatively great fluctuations in business; and a period of such fluctuations is the very kind in which it is most undesirable and dangerous to build up inventories. It is just too bad to have a large inventory when business undergoes a sharp "recession," as it did from the middle of 1937 to the middle of 1938.

It would have also been just too bad for industry and commerce not to have had available adequate, dependable and fast transportation service when, with their inventories depleted, they were suddenly confronted with such a great and unexpected increase in orders for goods of all kinds in the last one-third of 1939.

Manufacturers, merchants and shippers of all classes probably have given much less thought than it is worth to the benefit they derived from the ability of the railways to increase by 55 per cent between May and October, 1939, the number of carloads of freight they handled weekly without any congestions or delays.

Looking to the Future

What of the future? All experience prior to the last decade indicates that, assuming reasonable changes in government policies, there would speedily be a resumption of the increases in production, commerce and traffic that occurred in every decade prior to the last one. In the forty years ending with 1930 the country's total freight traffic increased an average of *90 ton-miles per capita* annually. If that same annual increase had occurred during the last decade, and the railways had got only 63 per cent of total traffic in 1939, as they actually did, their traffic last year would nevertheless have been 53 per cent larger than it actually was—and 14 per cent larger than in 1929. The difference between what the railways' traffic would have been last year, and what it actually was, almost equals all the traffic handled by other freight carriers.

Such facts should give shippers food for thought. They plainly indicate the amount of traffic the railways would be called upon to handle in case of a real resumption of progress. In their own interest shippers may well recall the forecast made by Mr. Hoover in 1922 of what would occur if there was not an early resumption of development and improvement of railway facilities. For his forecast was fulfilled in 1922-1923, and it was prevented from being fulfilled afterward only by the early resumption of the development and improvement of railway facilities that he emphasized was so necessary.

Today's Rail Service

J. E. BRYAN, President
General Traffic Manager
Wisconsin Paper & Pulp Manufacturers
Traffic Association
28 E. Jackson Blvd., Chicago, Ill.

R. R. LUDDECKE, Vice-President
General Traffic Manager
Standard Brands, Inc.
595 Madison Ave., New York, N. Y.

EDWARD P. LACEY, Executive Secretary
The Munsey Building
Washington, D. C.

T. C. BURWELL, Chairman Executive Committee
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223 W. Monroe St., Chicago, Ill.

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The Munsey Building
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THE NATIONAL INDUSTRIAL TRAFFIC LEAGUE

PROMOTER OF SOUND ECONOMICAL TRANSPORTATION

OFFICE OF THE PRESIDENT
28 East Jackson Boulevard
Chicago, Illinois

May 25, 1940

To American Shippers:

Transportation being the backbone of American industry and railways being such an essential part of transportation on which industry relies, it is necessary that efficient up-to-date service be rendered. Without such service, the growth, the expansion - the very prosperity of the nation - cannot be assured.

The passenger conveniences now offered by the railways have been made known to the public at large through the prudent use of theatricals, together with the glamour of the streamlined trains and their almost unbelievable accommodations for the comfort of the traveler. On the other hand the revolutionary development in the handling of freight with safety and dispatch, has not been given the publicity it deserves.

The Railway Age, by bringing all of these improvements in freight transportation within the covers of one issue, supplies a long needed want and at the same time constitutes a service to the users as well as the producers of transportation. A study of these pages will result in a greater knowledge and a finer appreciation of that which is now offered and thereby stimulate more complete utilization of railway freight facilities by shippers as a whole.

On behalf of the shippers of America I recommend the reading of this issue.

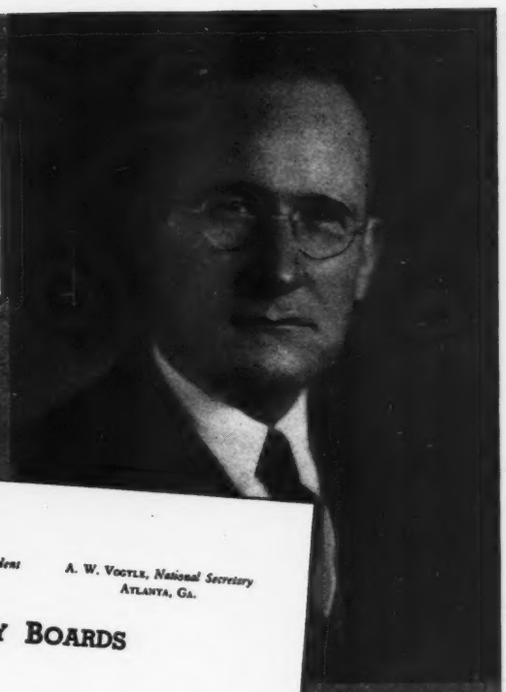
There is extended to the railways congratulations for their progressiveness and the wonderful strides made toward that perfection of service present day business demands. The progress made is a credit to the railways and a distinct benefit to American industry.

Yours sincerely,

J. E. Bryan

President

...ce a Boon to Industry



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May 25, 1940

To American Shippers:

Congratulations to the American railroads and their employees, as the Railway Age gathers and brings before us, in one outstanding issue, the facts showing progress of the times. We realize that through service and sacrifice the American railroads have wheeled a freight and passenger service, (geared to present day user demands), to the doors of the people.

Science, invention and work; correlated, mechanized and humanized to meet daily routine or emergency need, places the railroad transportation service within reach of all who need it to distribute their products or transport their people.

Adequate with facilities; qualified in personnel; cognizant of requirements; these American railroads are ready for the nation's transportation buyers to enter their orders for large or small quantities of transportation service--cash and carry, or credit terms of purchase can be chosen by the buyers. The service and the cost of it have progressed to the "super market stages" and all of this for constructive use by the nation and its people in building and extending commerce and industry and creating good will among states and nations. This is progress and to the credit of traditional trends in railway building and service and to its peak of adequacy today!

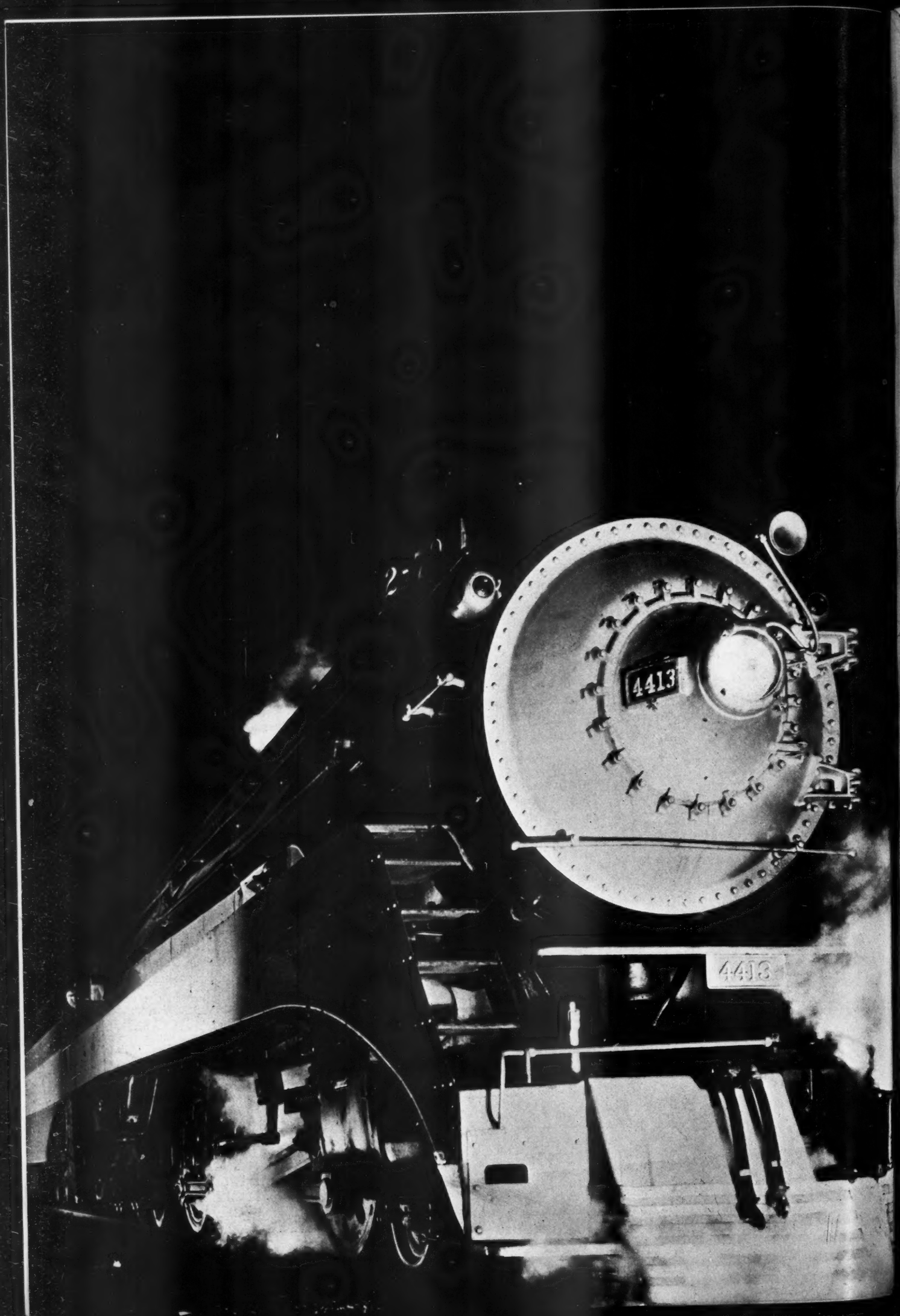
At the terminals, on the road, in the shop and in the office we find this progressed freight service paralleling the streamlined and glamorous passenger service and together they move forward to national high places in a world of place utility.

High compliments to the Railway Age for gathering and showing this progress and best wishes to the American railroads for their attainments.

Sincerely,

Charles Dowley

President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More for the Transportation Dollar

Revolution in freight service reveals efforts of the railways to give the shippers what they want

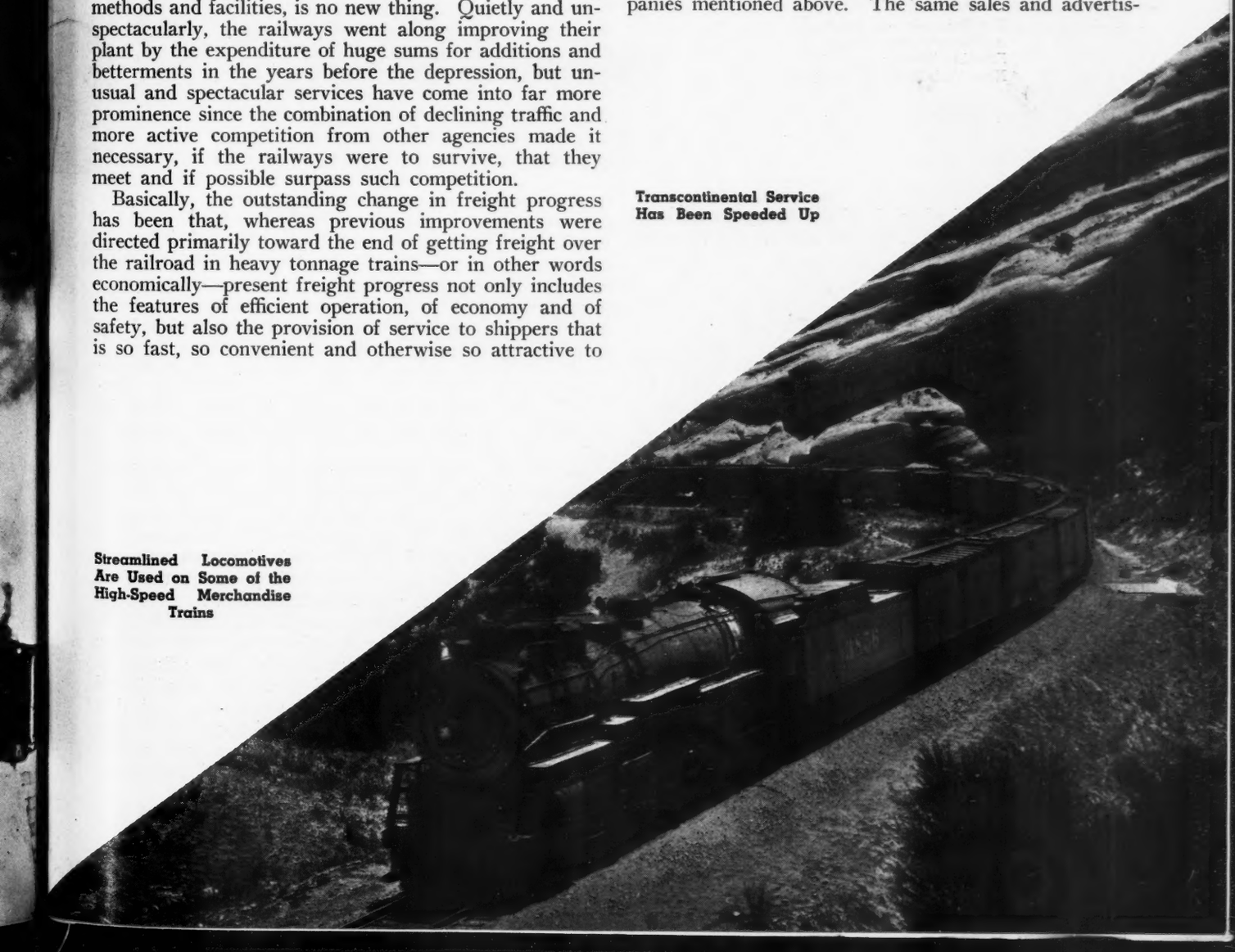
"HERE she comes—there she goes!" All over the country, spectators are commenting thus as the "flagship" of any one of several railways' fast freight fleets flashes past.

Freight trains at passenger train speeds, overnight deliveries at points as far as 500 miles distant, perishable trains that cut days from former schedules—all these have shrunk the transportation map of this continent materially in the last five years and have brought the jobbing, producing and consuming centers much closer together. A survey of the new freight services shows that these improvements have not been confined to the movement of any one commodity. The high-speed merchandise trains have been the most spectacular, but the elimination of the "drag" freight schedules has been of scarcely less importance. With cars spending less time in terminals and trains less time on the road, every commodity that the railways handle rolls to market in much shorter time today, with attendant savings to shippers in inventories and in many other ways.

Freight progress, in the sense of better operating methods and facilities, is no new thing. Quietly and unspectacularly, the railways went along improving their plant by the expenditure of huge sums for additions and betterments in the years before the depression, but unusual and spectacular services have come into far more prominence since the combination of declining traffic and more active competition from other agencies made it necessary, if the railways were to survive, that they meet and if possible surpass such competition.

Basically, the outstanding change in freight progress has been that, whereas previous improvements were directed primarily toward the end of getting freight over the railroad in heavy tonnage trains—or in other words economically—present freight progress not only includes the features of efficient operation, of economy and of safety, but also the provision of service to shippers that is so fast, so convenient and otherwise so attractive to the customers as to induce them to ship their freight by rail instead of by competing transportation agencies. The amount of research and study devoted to this end by the railways and the railway supply manufacturers in the last five years is stupendous in its scope—there is practically no feature of railway service that has not been gone over with a fine tooth comb for the purpose of making it more attractive to shippers.

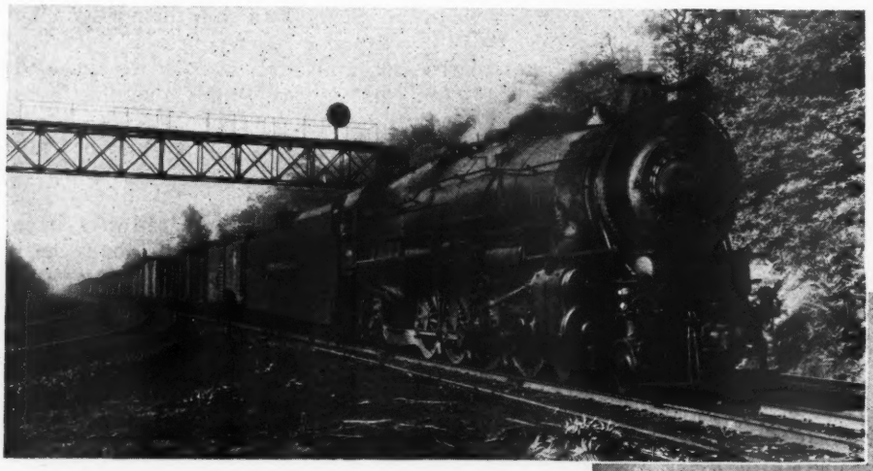
There is only one field in which the railways have been remiss, and that is in telling the public about these improvements in service. Not a few traffic men still insist that personal solicitation is the only way to get business, which is one of the reasons why the volume of railway advertising of all sorts is far below that of other industries. As many as ten highly successful companies, such as General Motors and Procter & Gamble, each have greater individual advertising budgets than the combined total of all railway advertising, both passenger and freight. The railways have a product to sell—transportation—and it varies only in kind from automobiles and soap, or other products sold by the successful companies mentioned above. The same sales and advertis-



Transcontinental Service Has Been Speeded Up

Streamlined Locomotives Are Used on Some of the High-Speed Merchandise Trains

ing methods that work for the country's most prosperous industries will work for the railways—and, as a matter of fact, they are working for some of the more alert and progressive lines, which realize that while personal solicitation is and will undoubtedly always remain the basis of freight traffic salesmanship, it does not, by any means, complete the job. When the railways had a monopoly of freight transportation, when the service was more or less routine and innovations were practically unknown, "ringing doorbells" may have been sufficient as a sales procedure, but such is not the case now.



Canadian National Fast Freight Leaving Toronto for Montreal

The Pennsylvania Handles a Million Dollars Worth of Freight Nightly on this New York-Pittsburgh Train

What Has Been Done

In 1939, for the first time in history, the average distance traveled per freight train per day passed the 400-mile mark. The 1939 figure was 401 miles, representing the average time required for the movement of all freight trains between terminals, including all delays en route. This speed was 62 per cent greater than the figure of 247 miles for 1920; it means that many freight trains are now being operated on passenger train schedules and that the principal terminals of the country have been brought hours or days closer together, depending upon the length of haul. Instead of retrograding in efficiency during the years of sharply curtailed revenues, the opposite has been true of the railways for at no time in railway history has their efficiency, as translated into service for the customers, been so great as at present—when the railroads haul a ton of freight a mile for a cent.

These results have been brought about by study and investigation, translated into action, on the part of individual railroads and the Association of American Railroads. Beginning with July 6, 1939, for example, a committee representing the A. A. R. began a comprehensive survey of competitive conditions and rates surrounding the movement of merchandise traffic, with the idea of working out a system for still better service. This committee, headed by the assistant chief traffic officer of the A. A. R., included representatives of the eastern, western and southern railroads. It held conferences with hundreds of shippers at the 12 most important railroad centers between Boston and Los Angeles, and inspected facilities at many of those points. It collected voluminous data with respect to the movement of merchandise traffic, and of carload traffic as well, and, as a result of its studies, made a number of recommendations to the traffic executives of the railways.

At a meeting of these officers on September 28, 1939, twelve of the recommendations of the committee were adopted, dealing largely with the simplification of l. c. l. freight, but also including the important recommendation "that the railroads' solicitation practices be thoroughly examined and that more intensive effort be directed toward selling the railroad industry and services to the public."

In March, 1940, a further group of ten additional recommendations was accepted and approved by the traffic executives. Important among these was the suggestion that the railroads should make split deliveries, that is to say, they should afford complete transportation of pool carload traffic from break-bulk points to the final destination. Another recommendation was that the railways should exercise closer supervision and avoid duplication of their pick-up and delivery services. Other recommendations were that the shipping public should be kept more thoroughly informed as to the schedules of merchandise cars operated by the railways, and that freighthouse hours should be staggered to permit of later deliveries by the shippers and thus meet the service offered in this respect by other agencies of transportation.

The work of this committee will be translated into

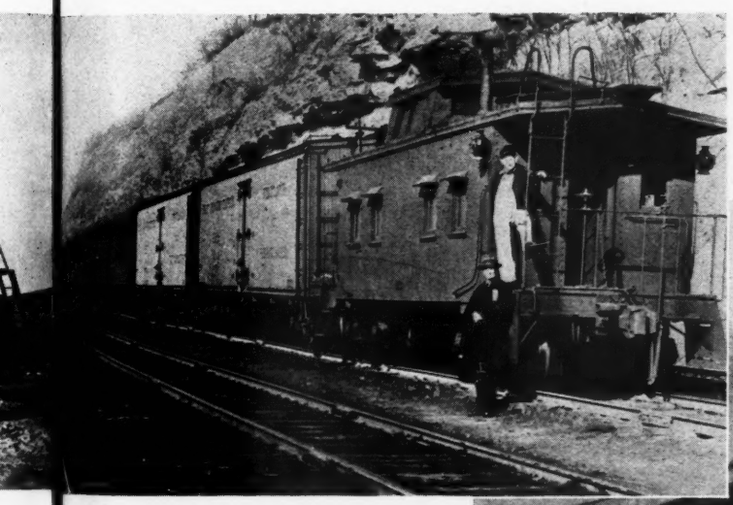
better service for the shipping public, and it is indicative of the concerted move being made by the railways to improve the movement of merchandise traffic. The activities of the committee were not, however, confined entirely to l. c. l. traffic, nor has its work been finished. Several other recommendations were made which are now being given careful study and a continuing survey of the situation is being made to meet and anticipate the shippers' needs.

From the Ground Up

The freight service of the railways is literally being rebuilt from the ground up. Better roadbed and better track, modern machinery for maintenance gangs to increase their efficiency and to reduce the delays to trains attendant upon their work have all been important contributions to freight progress. The strides made in better signaling to reduce train delays have been amazing and important. Lightweight steel is rapidly entering the freight car field, and the demands of high speed are producing freight cars and locomotives equipped with new and improved devices to permit of their operation in unusually fast service safely and without damage to lading. The first Diesel-electric locomotive for main line freight service has made its appearance and has completed several test runs.

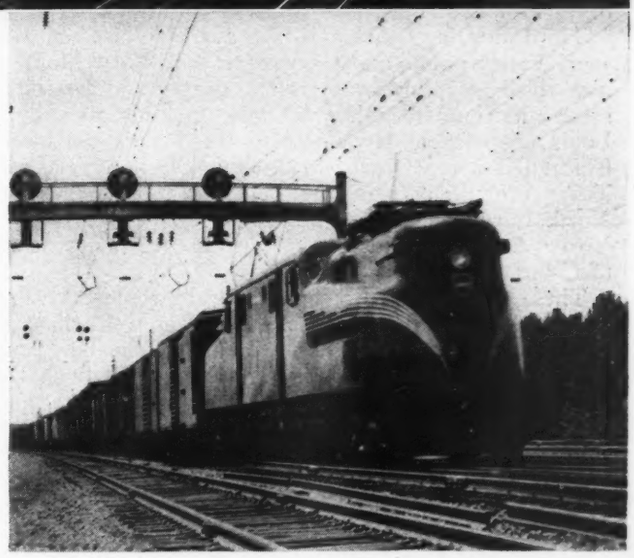
Maintrackers and fast overnight merchandise trains are moving freight from point to point at speeds hitherto unequalled. Freighthouse and yard methods are in the process of constant revision to give the shipper better service—or more for his transportation dollar. Pick-up and delivery service on a universal basis is enabling the railways, for the first time, to render a complete transportation service for the shipper and the receiver. In brief, freight progress on the railways is proceeding today at a breathtaking speed, with a revolution in freight transportation not only in prospect, but actually in progress. Typical examples of the truly astounding record of freight progress in recent years are given in detail in the following pages. These examples are multiplied in every section of the country and the announcement of improved freight service in this, that or the other locality is a matter of almost daily occurrence. This is true not only of the larger systems, but also of the shorter lines which have adjusted and improved their schedules to meet those of their more powerful neighbors.

All of the improvements in general service have not been so spectacular, nor have the involved sums been in excess of $100,000,000, as did the Pennsylvania electrification between New York, Washington and Harrisburg, or the West Side improvements of the New York Central on Manhattan island which involved the construction of an elevated line to many customers' doors and directly through their buildings in many cases, as well as a huge freight terminal in downtown New York. Nonetheless, these general improvements on every railway have amounted to a staggering total of better service to shippers everywhere, and, taken in the aggregate,



This Jersey City-Pittsburgh Train of the B. & O.-Reading-C. R. R. of N. J. Makes 524 Miles Overnight

Santa Fe No. 39 Arriving in Kansas City from Chicago



The Speed Witch of the Penna.-New Haven Operates Between Boston and Baltimore

mean a betterment in rail transportation unequalled in any previous period in the history of the railways.

At no previous time have shippers been able to get as speedy and accurate reports on the location of their shipments as at present. On not a few roads, passing reports are available to shippers at all hours by keeping certain transportation department offices open 24 hours a day, and these offices also take care of reconsignments. This is true not only of the trunk lines, but of the terminal roads as well, which have revised their operations to keep pace with the improved service offered by the through routes.

Faster Service an Important Factor

Schedule improvements, bringing major terminals days closer together, have been widespread, a recent and spectacular example of this having been the cutting of a full day from the schedule from Chicago and Mississippi river points to the Pacific Coast, which was made effective on April 6, 1940. Texas and Oklahoma points are now a day nearer Chicago as a result of recent schedule changes between those points. Florida, Georgia and lower Carolina cities are a day nearer Washington and northern industrial centers, and Cincinnati is a day closer to Jacksonville, Fla.

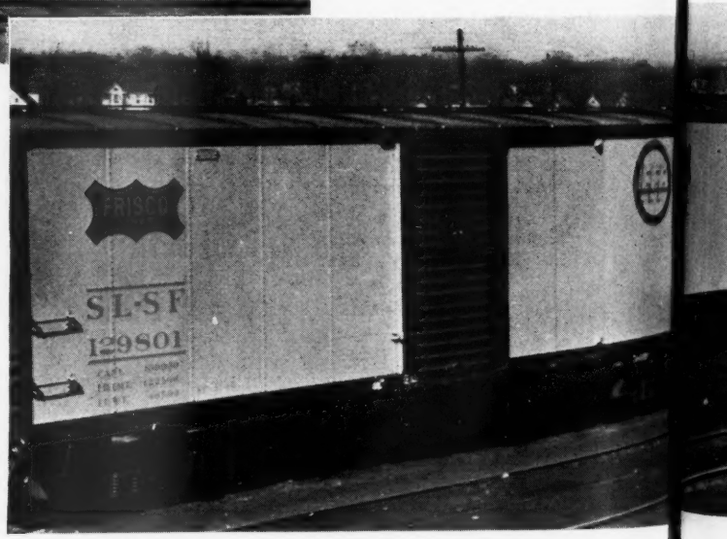
Third morning delivery is now available between Missouri Valley points and the eastern seaboard. Maine is now third morning away from Chicago, and Detroit is second morning from New England. Chicago and St. Louis are each a day closer to the Pacific northwest. Chicago is a day nearer to Atlanta. Los Angeles and Texas are a day closer in both directions. Western North Carolina and Virginia are a day closer to New York. St. Louis and Kansas City are 12 hours nearer to Colorado points.

These service improvements naturally represent vastly better schedules to intermediate points as well, since, by the use of these faster trains for an intermediate haul, farther distant points can take advantage of much better schedules on transcontinental and other long distance traffic. The savings to shippers and receivers in inventories and in interest charges on investment are self-evident, and represent huge sums.

One of the advantages of rail over highway transportation is in speed for distances of 300 miles or more. The railways were, perhaps, somewhat late in realizing and cashing in on this definite advantage, but that this situation no longer exists is amply demonstrated by the appended list of high-speed freight trains now giving early first morning deliveries between points 300 miles or more distant. It will be noted that in some cases early first morning deliveries are made at distances of over 500 miles. Several of these trains handle only less-than-carload traffic. All of them operate at speeds that would have been considered impossible only a decade ago, and their record of on-time performance has been uniformly excellent. Practically all of the locomotives used were re-designed and equipped with specialties to adapt them to this high-speed service.

In most instances, standard cars are used. Where this is the case, such cars are usually selected carefully in advance from the equipment available at the initial terminal, to insure modern equipment being used in high-speed service. However, trains recently inaugurated, reveal a trend toward cars of lightweight construction, equipped with many of the specialties recently evolved for high-speed freight service, and built particularly for the overnight trains, to be used in pool service on such trains. High-speed freight service demands the best of cars.

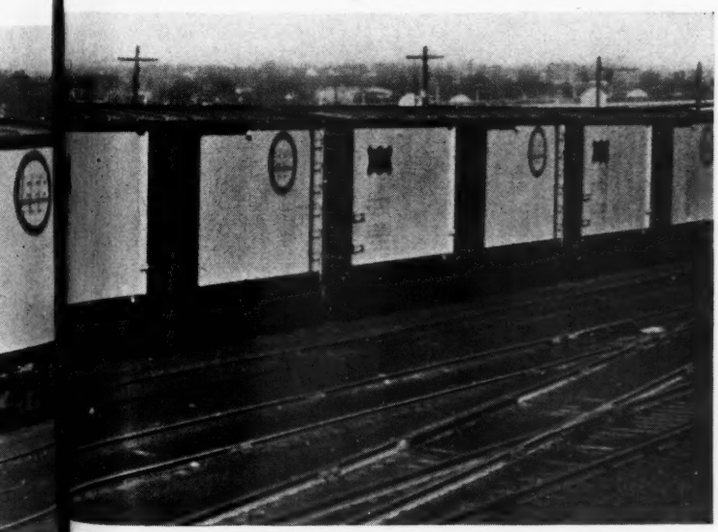
In addition to the trains listed, there are, of course, innumerable trains giving overnight service between important terminals less than 300 miles apart. Examples such as Boston-New York, New York-Washington, Buffalo - Cleveland, Cleveland - Cincinnati, Detroit - Chi-



Some of the Roads Use Distinctively Painted Cars on the High-Speed Trains

Some Locomotives Handle the Streamlined Passenger Trains are Seen on the Southern Pacific "Overnights"

cago, Chicago-St. Louis, Atlanta-Chattanooga, Birmingham - Atlanta, Kansas City - Omaha, San Francisco-Fresno, Portland-Seattle, might be cited endlessly, but these trains, while quite as important as those listed, do not require particularly high-speed operation because of the shorter distances involved. Also, the following list in alphabetical order has been confined to trains specializing in the handling of merchandise and general traffic. Special movements such as perishables and livestock are dealt with in detail later.



The Fast Fleet of Overnight Flagships

Railroad	*From*	*To*	*Mileage*
A. T. & S. F.	Chicago	Kansas City	449
	Kansas City	Dodge City, Kan.	339
	Kansas City	Oklahoma City	346
	Fort Worth	Galveston*	347
B. & O.-Reading C. R. R. of N. J.	Jersey City	Pittsburgh*	524
B. & M.-N. Y., N. H. & H.	Portland, Me.	New York*	337
C. N.	Montreal	Toronto*	344
C. P.	Montreal	Toronto*	351
C. B. & Q.	Chicago	Creston, Iowa	385
	Lincoln, Neb.	Denver*	479
D. & R. G. W.	Denver	Minturn, Colo.	302
D. L. & W.	Hoboken, N. J.	Buffalo*	395
Erie	Jersey City	Buffalo*	424
I. C.	Chicago	Memphis	510
	Chicago	Jackson, Tenn.	439
L. V.	New York	Buffalo*	446
L. & N.	Louisville	Memphis	380
	St. Louis	Nashville	324
M. K. & T.	St. Louis	Parsons, Kan.	387
M. P.	St. Louis	Texarkana, Ark.	493
	Omaha	St. Louis	479
	Houston	Harlinger, Tex.	347
N. C. & St. L.	Atlanta	Martin, Tenn.*	425
	Chattanooga	Memphis	390
N. Y. C.	New York	Buffalo*	429
	Weehawken, N. J.	Buffalo	429
	Cleveland	Chicago*	340
N. Y. C. & St. L.	Chicago	Cleveland*	336
N. Y., N. H. & H.-Penna.	Boston	Baltimore*	419
Penna.	New York	Pittsburgh*	439
Seaboard	Richmond, Va.	Charleston, S. C.	420
	Atlanta	Jacksonville	413
St. L.-S. F.	St. Louis	Tulsa, Okla.	424
St. L. S. W.	St. Louis	Texarkana, Ark.	557
Southern	Atlanta	Cincinnati	487
	Atlanta	Jacksonville	346
S. P.	San Francisco	Los Angeles*	470
	Los Angeles	Tucson, Ariz.	546
	San Francisco	Ashland, Ore.	408
T. & P.	Fort Worth, Tex.	Alexandria, La.	438
	Dallas, Tex.	Monahans, Tex.	400
U. P.	Portland, Ore.	Boise, Idaho	491
	Los Angeles	Las Vegas, Nev.	335
	Salt Lake City	Las Vegas, Nev.	450
	Denver	Ellis, Kan.	337
	Omaha	Julesburg, Colo.	358

* Train operates in both directions.

Completing the Transportation Service

While everyone is interested in the speeds made by the fast trains, the customer is also interested in when the goods will be delivered at his door. Train movement is only part of the transportation movement and

* Train operates in both directions.

the agency that can give the best complete transportation, including overall speed from door to door, at the lowest cost, will get the patronage. In the past, this lack of "the complete service viewpoint" has been responsible for the diversion of a large amount of tonnage from the rails to the highways.

Universal pick-up and delivery service has aided materially in supplying this complete transportation service and in some cases this is sufficient. Many roads, however, have supplemented such service by inter-city highway trucking lines. Such rail-highway co-ordinated service has been quite successful as a traffic producer on a number of roads, and the use of motor trucks to save time in delivering and picking up freight at local stations for distribution or concentration at designated zoning stations in conjunction with fast train service is growing rapidly.

Part of the Missouri Pacific Truck Fleet

The following summary lists alphabetically what individual railways have done or are planning in the way of rail-highway co-ordination in freight service exclusive of terminal pick-up and delivery service. A large number of the railways operate their own trucks through wholly-owned highway subsidiaries. Several other railways use the Railway Express Agency, or other contract truckers to operate the co-ordinated service in the name of the railway.

Atchison, Topeka & Santa Fe: The Santa Fe Transportation Company operates several truck routes in Kansas and in Southern California.

Atlantic Coast Line: This railway has applied to the I. C. C. for permission to operate rail-truck service at several points in Virginia and North Carolina.

Baltimore & Ohio: Through various contract operators, this railway has some 20 co-ordinated services, including a Baltimore-Washington route.

Boston & Maine: The B. & M. Transport Company operates 24 highway units between industrial towns in Massachusetts, Maine and New Hampshire.

Canadian National: This company operates several trucks under contract, radiating from Toronto, Ont.

Canadian Pacific: This railway maintains contract operations in the vicinity of Montreal and has inaugurated a complete co-ordination service in Nova Scotia along the lines of its subsidiary, the Dominion & Atlantic.

Central of New Jersey: This company operates five trucks in co-ordinated service on routes in Pennsylvania and New Jersey.

Central Vermont: Co-ordinated service is operated between St. Albans, Vt., Burlington and Montpelier.

Chesapeake & Ohio: The Railway Express Company operates several trucks for the C. & O. in the coal districts of West Virginia.

Chicago & Eastern Illinois: Between Chicago and Chicago Heights, 15 highway units are operated in freight transfer service.

Chicago & North Western: Some 85 highway units radiating from Proviso yard, Chicago, serve a 60-mile area, including the handling of merchandise from Chicago connections. Contract truck operations are effective at many points in Wisconsin, Michigan and South Dakota and applications are now pending for several Iowa routes which will permit zoning operations along the main line and branches in that state.

Chicago, Burlington & Quincy: The Burlington Transportation Company operates 176 freight units, largely in the territory between Chicago and Omaha and a completely co-ordinated service is being worked out.

Chicago, Milwaukee, St. Paul & Pacific: This railway has co-ordinated service at some 12 points through contract truckers.

Chicago, Rock Island & Pacific: The Rock Island Transport Company operates 162 units over 1,500 miles of highway routes in virtually all the states served by the Rock Island.

One of the Missouri-Kansas-Texas Trucks Near Parsons, Kan.

Delaware, Lackawanna & Western: This company operates several trucks under contract, radiating from Scranton, Pa., and Kingston.

Denver & Rio Grande Western: The Rio Grande Motor Way operates 24 trucks in co-ordinated service in Colorado.

Erie: Contracts for co-ordinated operation under the zoning system are in effect at several points on this railway.

Great Northern: The G. N. Transport Company operates a large fleet of trucks in co-ordinated service in Montana, as well as a few routes in Minnesota.

Gulf, Mobile & Northern: The Gulf Transport Company offers a co-ordinated service that parallels practically all of this railway.

Illinois Central: Under contract with the Railway Express Agency, eight trucks are operated out of Carbondale, Ill.

Kansas City Southern-Louisiana & Arkansas: A complete co-ordinated system parallels the lines of the K. C. S. with railway-owned trucks, and the L. & A. operates several truck routes under contract.

Maine Central: The Maine Central Transportation Company operates several truck routes at various points in Maine.

Minneapolis & St. Louis: This railway has recently begun co-ordinated service in South Dakota on 346 miles of truck routes.

Minneapolis, St. Paul & Sault Ste. Marie: This railway operates truck routes under contract at several points.

Missouri-Kansas-Texas: The M-K-T Transport Company operates six routes in the vicinity of Parsons, Kan.

Missouri Pacific: Through various contractors, this railway operates 3,330 miles of highway routes in seven states, from Nebraska to the Lower Rio Grande valley in Texas.

New York Central: This railway has co-ordinated service at many points on its system.

New York, New Haven & Hartford: The New England Transportation Company supplies a complete co-ordinated service, with a fleet of 311 highway units operated in the New England states served by the railway.

Northern Pacific: The N. P. Transport Company operates 57 highway units in Montana, giving a complete co-ordinated service along the N. P. in that state.

Pennsylvania: This railway operates a complete rail-highway co-ordinated service, involving a fleet of 5,000 highway units engaged exclusively in co-ordinated operations, including pick-up and delivery. The zone station system for the concentration and distribution of l. c. l. freight is in effect throughout the system.

Reading: This railway operates nine trucks on several routes in Pennsylvania and New Jersey.

St. Louis-San Francisco: The Frisco Transport Company operates co-ordinated service over 1,200 miles of routes in Missouri, Arkansas, Kansas and Oklahoma.

St. Louis Southwestern: Through the Southwestern Transportation Company, owning one of the largest truck fleets in the Southwest, this company operates a complete co-ordinated service along its lines.

Seaboard: With a fleet of 33 highway units, this railway operates co-ordinated routes in North Carolina, South Carolina, Georgia and Florida.

Southern Pacific: The Pacific Motor Trucking Company operates a fleet of 429 highway units over 5,739 miles of truck routes, giving complete co-ordinated service along its Coast lines, as well as in Texas and Louisiana.

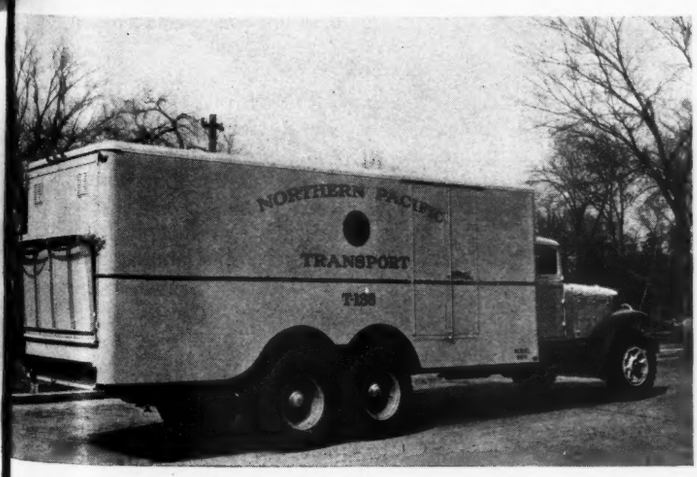
Texas & Pacific: The T. & P. Transport Company operates a fleet of 57 highway units, over 2,164 route miles in Texas, Louisiana and New Mexico.

In addition, several of the short lines have made use of co-ordinated service effectively in many parts of the country. As a matter of fact, one 30-mile line has built up a fleet of trucks which operate daily over some ten times more highway miles than the railway's train miles.

The service improvements, particularly to local and branch line stations, that are being brought about by rail-highway co-ordination—the use of trucks in connection with fast overnight trains—mean that days are being cut from previous all-rail schedules. A spectacular example of this is found on the T. & P., in improving its service between Dallas and Fort Worth and the oil fields on a branch line in Lea county, New Mexico, centering around the town of Hobbs. Truck schedules out of Monahans are co-ordinated with a new fast train, and the trucks make the 112-mile trip to the oil fields in four hours. The co-ordinated run of over 500 miles is now made in less than 19 hours, as compared with the previous all-rail schedule of 72 hours, saving 53 hours.

Another interesting use of rail-highway co-ordinated service was brought about by the recent abandonment of the Okolona, Houston & Calhoun City, a 37-mile railway that extended from Okolona, Miss., to Calhoun City. This left a gap in transportation service to several towns, but the Gulf Transport Company, a wholly-owned trucking subsidiary of the Gulf, Mobile & Northern, was able to step in and provide the communities affected with co-ordinated service centering at Houston, Miss.

The growth of rail-highway co-ordinated service has been spectacular and it has represented a distinct benefit to thousands of communities that could not be served adequately by all-rail movement. Although the growth has been hampered by policies of the Interstate Commerce Commission, the shippers and receivers have been solidly behind it and with good reason, in view of the service improvements. Applications for the inauguration and expansion of such service are frequently accompanied by the approval of all the shippers in the territory



The Northern Pacific Operates a Large Truck Fleet in Montana

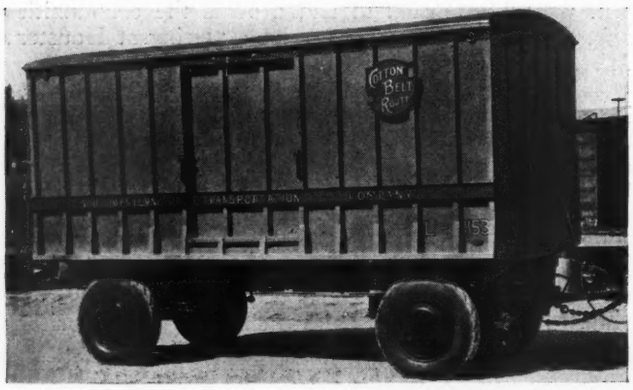
The Southern Pacific Has Completely Co-ordinated Rail-Highway Service

affected and they also appear in support at the hearings. Once a sound and constructive policy is adopted by the various state and national commissions, the benefits of rail-highway co-ordinated service will be extended rapidly.

"Catering" to America

The transportation service afforded by the railways on the movement of perishables has made the American table the richest in the world in fresh fruits and vegetables. Of even greater importance is the fact that agriculture and the great industry devoted to the distribution and sale of agricultural products owe much of their progress to the service given them by the railways which has enabled them to expand their markets and create new consumer outlets.

Trains roll out of Florida and south Texas to the north, and east from California and the Pacific Northwest en route to the nation's dining rooms faster and more efficiently than ever before. While the cars are en route, effective marketing at the right prices is made possible by railway diversion bureaus that remain open



The St. Louis Southwestern Operates a Large Truck Fleet in Several States

24 hours a day to serve the needs of the shippers. At the destinations, perishable handling is expedited by new produce yards that are being built by the railways at many points at large expenditures despite the depression.

As fast as new methods of shipping are devised, the railways are adjusting their operations to meet the changed situation. Top-icing, now largely used, means that cars must now be iced after loading instead of before, and to meet this situation at the convenience of the shippers, closing hours are being extended. In southern Florida, for example, the closing hours for accepting freight formerly ranged from 4:30 p. m. to 7—now they range from 7:30 p. m. to 11, and similar adjustments have been made wherever top-icing is used.

Seventh morning auction delivery, which means 3 a. m. placement, is now guaranteed in Chicago on perishables from the Pacific Coast, and this means, too, that through cars make connections with the eastern lines early morning trains, thus saving a day to eastern destinations.

Fruits and vegetables loaded in southern Florida on Monday arrive in Jersey City at 8 p. m. Wednesday and are available for the early morning markets in the metropolitan district on Thursday. This expedited service is participated in by all the lines, and it means that the trains run from Jacksonville to Potomac yards, across the river from Washington, D. C., in 24 hours, a distance via the S. A. L.-R. F. & P., for example, of 756 miles.

On the A. C. L., these trains leave Savannah, Ga., at 2:30 p. m., and arrive at Richmond at 4:45 a. m. As late as 1925, the Florida Special, a luxury Florida-New York passenger train, was scheduled to leave Savannah at 4:15 p. m. and arrive at Richmond at 6:35 a. m., an elapsed time of 14 hr. 20 min. for the 509 miles. Today, as indicated, the perishable trains make this distance in less time than the premier passenger train did fifteen years ago. The R. F. & P. runs these trains non-stop from Richmond to Potomac yard, averaging well over 40 m. p. h., and the Pennsylvania and the B. & O. handle them from Potomac yard to Jersey City, approximately 240 miles, in 7 hr. 30 min.

The Canadian roads have pioneered in the use of cars equipped with ice bunkers in the roof and heaters that can be manipulated from outside the car, and some of these are now being used in the United States. The Canadian Pacific has improved its service 24 hr. on fruit from the Okanagan valley in British Columbia to Eastern markets. This road, as well as the Bangor & Aroostook and connections, has improved the service on Maine potatoes by 24 hr. to many destinations, and the Chesapeake & Ohio has improved its potato movement from North Carolina to the West a full day.

The Missouri Pacific saves shippers a day on perishables from the Winter Garden-Laredo growing district south of San Antonio, Texas, and the S. P. and Santa Fe are doing the same for Arizona growers on move-

More than 5,000 Highway Trucks are Used in Pennsylvania Service

ments to Chicago. The Chicago & North Western, the St. Louis-San Francisco, the Chesapeake & Ohio and the Missouri Pacific are using portable refrigerators for less-than-carload perishables, thus still further expanding the perishable market. These latter services, picked geographically at random, are indicative and typical of improved perishable service everywhere in Canada and the United States.

Filling the Nation's Bread Basket

No discussion of the movement of agricultural products by rail is complete without reference to the stupendous pageant of the annual movement by the railways of the winter and spring wheat crop. Here again, the railways have displayed their ingenuity in meeting unex-

The Seaboard Has Numerous Highway Operations

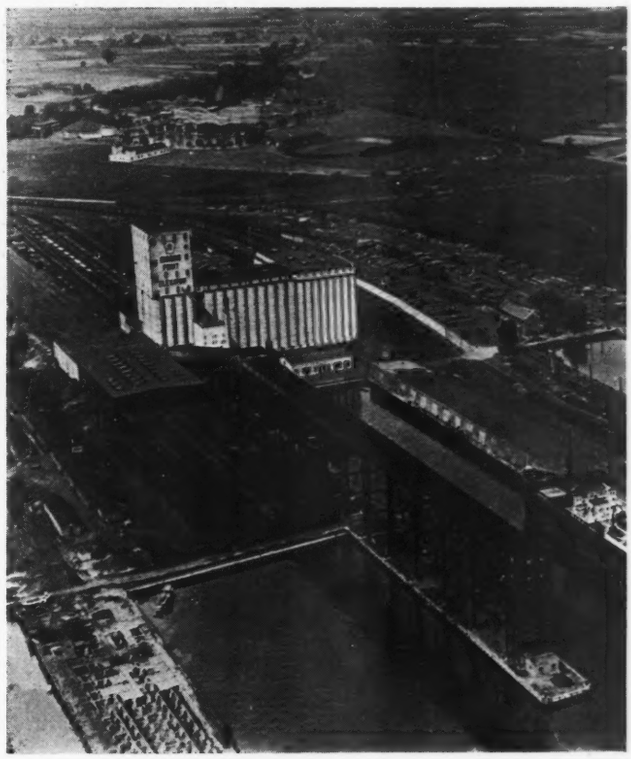
pected developments. Until a decade or so ago, all wheat was harvested by the thresher method, which meant that the crop was loaded gradually and the wheat rush was spread out over a period of months.

Then the farmers began harvesting by the combine method, which means that much of the grain is loaded as soon as it is cut and narrows down the wheat rush to a period of weeks, or even days, in some instances. Despite this, the railways, with the assistance of the Car Service Division of the Association of American Railroads, and of the shippers themselves through the media of the regional advisory boards, are able to take care of the tremendous rush annually, without car shortages, without dumping wheat on the ground and without inconveniences and delays to their customers.

This has been brought about by assembling as many box cars as possible by the wheat-loading roads prior to the harvesting. These empties are then placed in

A Refrigerated Highway Unit Operated by the Great Northern in Montana

strategic locations in the loading areas. Since the shippers now know that car shortages are highly unlikely, they co-operate by ordering only such cars as they will be able to load each day. Traveling crews of car repairers inspect the cars thoroughly before loading, so that there will be no break-down because of bad order cars. The huge grain yards are prepared and made



Huge Expenditures Have Been Made for Grain Facilities

ready for emergency operations. On the Canadian Pacific, for example, the mammoth Transcona yard near Winnipeg, used during the rest of the year only for storing cars, is re-opened for the classification of wheat over the hump each autumn.

Agents of the Car Service Division are distributed throughout the loading territory to police possible abuses of car supply and handling. Arrangements are made for prompt unloading and release of cars at the terminal elevators.

All these things are done, moreover, before the flood of grain begins to pour over the railways, and, as a result of advance preparation, faster turn-around of cars, and shipper co-operation, railways cope successfully with 500 or 600 per cent increases in traffic that occur with lightning-like rapidity.

The railways on the Texas and Oklahoma plains first swing into action early in June. As the summer prog-

One of the Santa Fe's Fleet on Kansas Routes

resses, harvesting of winter wheat spreads northward across the Kansas plains and into southern Nebraska, where, late in the summer it meets the harvesting of winter wheat. Then, as fall approaches, the Dakota and Minnesota plains give up their yield until, finally, the winter wheat from the Canadian prairie provinces starts rolling down toward the head of the lake for transfer into boats. Meanwhile, in the U. S. S. R., even in years when the wheat crops of the steppes is equal or greater than ours, the peasants are starving, because the railways are ill-equipped for the handling and distribution of grain.

Famines there are caused by faulty transportation much more than poverty, and America has never experienced a famine since the railways took over the job of transporting foodstuffs a century or more ago.

Steaks and Chops

Comparable improvements in service have also been made by the railways in their handling of livestock, meat and packinghouse products. The physical aspects of the movement are better, with improved stock pens, drainage, feeding, watering, warehousing and weighing conditions, with better accommodations for the comfort and convenience of caretakers and drovers. At one end of the scale is the calf-or-carload plan that is being offered by some railways for the handling of small lots of cattle; at the other the operation of special trains in special service whenever there are ten or more cars from the same locality.

Livestock en route must be fed, watered and rested every 36 hours, and it is along these lines that the greatest improvements have been made.

Runs where one or two feedings were previously necessary have been shortened to come within the 36-hr. limit so that no rest stops are necessary now, with attendant savings to shippers and much less shrinkage. For example, the C. B. & Q. and the U. P.-C. & N. W., which run stock trains from Denver to Chicago, over a thousand miles, in 32 hours or less, are saving the lamb growers of Colorado alone more than half a million dollars annually by this service. In addition, runs that were formerly two or three-feed runs are now handled with only one intermediate feed stop, such as those of the C. M. St. P. & P. from central Montana to Chicago, approximately 1,600 miles.

Other typical examples of improved service on livestock are to be found in great numbers. The Canadian National and the Canadian Pacific have 24-hr. faster schedules from Western Canada to Montreal and Toronto. The Canadian National has speeded up its Montreal-Halifax run, 840 miles, on export cattle so that no rest stop is necessary; the Santa Fe hauls cattle for distances of more than 800 miles from the Texas range country to the Kansas pastures within the 36-hr. maximum.

The Southern and the L. & N.-N. C. & St. L. have improved livestock and meat schedules from St. Louis to the Southeast by 24 hr. Effective April 20, 1940, the M-K-T put in a pick-up service for carload livestock which now affords a complete farm-to-market service.

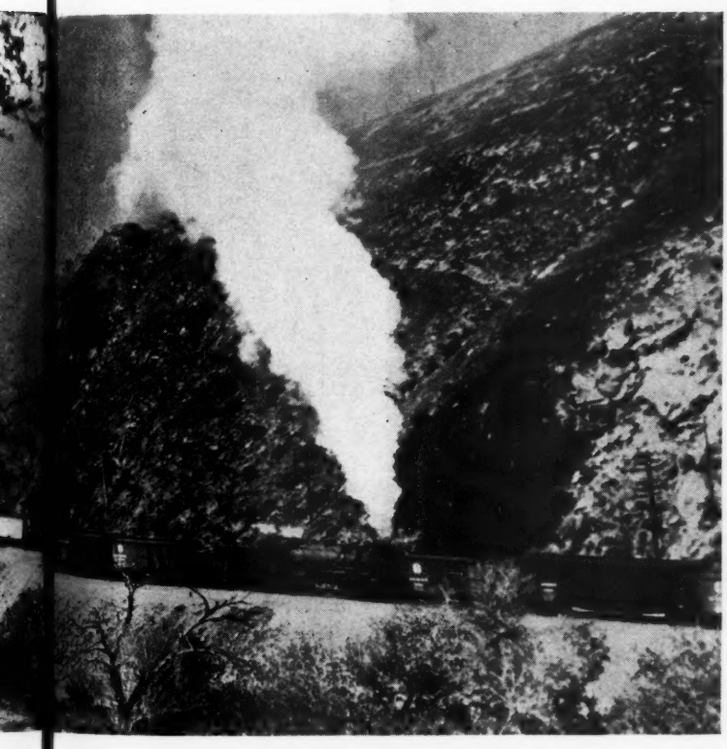
Typical of the excellent, regular service in the range country is that provided by the Union Pacific. On the Eastern district, between points in eastern Wyoming, western Nebraska and from Denver, to and beyond Missouri river destinations, a fast livestock train service is in effect, so timed as to enable the shippers to accomplish delivery either at the intermediate stockyards, Omaha, St. Joseph and Kansas City, or at the Chicago market without stopping en route for food, water and rest.

Similar service on the other districts give access

Florida Perishables Now Reach New York for Third Morning Markets

to their markets, and close attention is paid to the requirements of livestock traffic, with schedules and service developed and co-ordinated for the purpose of effecting maximum practicable speed of deliveries with the minimum of transit losses through shrinkage.

Packinghouse products are given similar fast movement. The evening stock yards train of the C. & O. out of Chicago gives 4:30 a. m. delivery at Cincinnati, some 280 miles away. Fort Worth, Texas, has been brought 24-hr. closer to St. Louis, so far as packinghouse products are concerned, by fast schedules on the railways serving those two important points. The Calumet from Council Bluffs and the Mohawk and the Sunbeam from the Twin Cities enable the C. & N. W. to offer 24-hr. faster service to New England and the east generally via Chicago and eastern connections. The needs of the shippers of livestock, meat and packinghouse products are peculiar to that industry, but the railways have studied those needs and met the requirements and are stopping the trend of such traffic away from the rails.



Pacific Coast Fruit and Vegetables Roll East on Guaranteed Deliveries

They are able to handle long distance livestock movements with much less shrinkage and much less cruelty than is possible over the highways and the new fast services are demonstrating this fact to shippers more and more.

No More "Drag" Freight

Heavy bulk commodities are sharing in service improvements equally with commodities that were formerly known as "fast freight" or "hotshot stuff"; and this term now applies to everything that the railways handle, whether it is silk or bulk stone used for fluxing in blast

Millions Have Been Spent by the Railways for Produce Handling Facilities in the Consuming Centers

furnaces. Changes in inventory and marketing methods in the coal industry, for example, have cut down the size of the stock piles in the coal dealers' yards materially, and to meet these new demands for service on coal, huge expenditures have been made by the coal-handling railways, of which the following are typical.

The Norfolk & Western has spent $3,000,000 for a new low-level pier for transferring coal from cars to steamships at Lambert Point, Va., to speed the movement and to reduce breakage. In October, 1939, this road, in common with others in the coal region, was called upon to handle a vastly increased coal traffic. All of the roads through the purchase of new equipment, were prepared and no car shortages resulted. In the specific case of the N. & W., the coal traffic for that month was 7 per cent greater than any other month in the road's history, but the $25,000,000 spent in the years immediately preceding for 12,500 new coal cars enabled the additional business to be handled without a hitch. The N. & W. is now expending $500,000 for a new coal classification yard at Lambert Point to augment its already huge Tidewater coal plant.

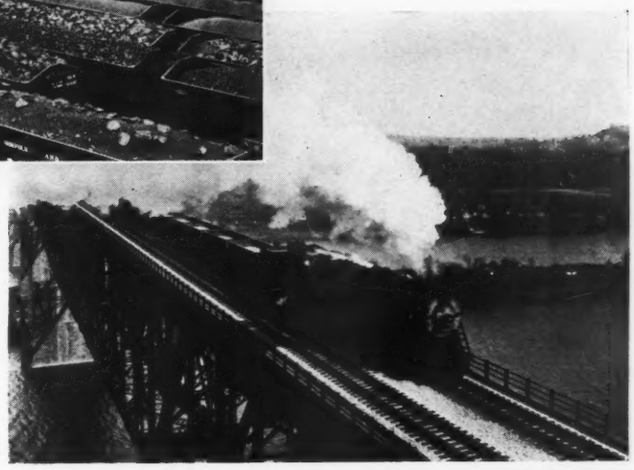
The Delaware, Lackawanna & Western recently installed car retarders in its Hampton classification yard at Scranton, Pa., to speed the movement of coal and the distribution of empties; the Chicago & Illinois Midland has expended large sums for giant locomotives to handle Illinois coal; the C. & O. has indulged in a program of improvements in handling coal for several years, and the Lehigh Valley has built a modern thawing facility at Perth Amboy, N. J., where coal is thawed by artificial fog during the winter months, at a saving in time of 8 to 16 hours. The Pennsylvania placed a huge new car dumper, involving a new coal dock, in service at Sandusky, Ohio, on July 18, 1939, which handles a car a minute, and by the time navigation closed, 2,745,000 tons of coal had been unloaded and dumped into lake cargo vessels.

This Canadian National Train Handles Export Livestock Over 800 Miles Within the 36-Hour Limit

This Giant Dock of the D. M. & I. R. Gives Efficient and Speedy Ore Handling at Duluth

The handling of iron ore forms the basis for the steel industry and the roads such as the D. M. & I. R., the G. N., the Soo and the N. P. which participate in this movement from the iron range country to the head of the lakes have all made vast improvements in their operating methods and equipment to accelerate the movement of this traffic on its way to the mill. The giant railway docks at the west end of Lake Superior are models of efficiency in the prompt transfer of ore from car to boat, as are the docks on Lake Erie where the reverse operation takes place and ore is transferred from boats to cars for movement into the Pittsburgh district. The Bessemer & Lake Erie has in service more than 4,000 new, lightweight ore cars to improve the ore movement from the lake to the mills. The finished steel products, of course, are given service that is the practical equivalent of the

Coal Is Now a High-Speed Commodity in Rail Service



An Ore Train Rolling Into Pittsburgh on the B. & L. E.

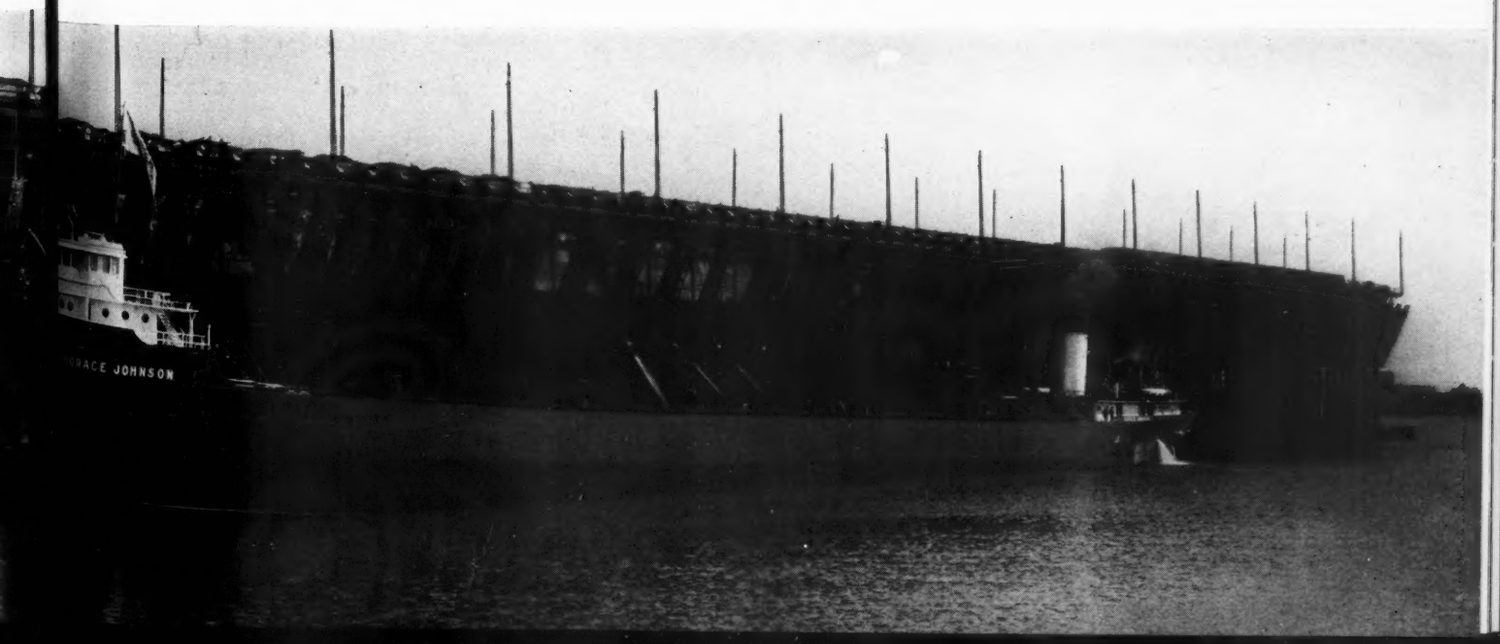
fast overnight merchandise service from all the steel manufacturing districts to the points of consumption.

Crushed rock and gravel are given preferred handling under the present railway transportation improvements. For example, the S. P. operates special rock and gravel trains from the Livermore, Calif., quarry district to the San Francisco area to give contractors and builders there regular and dependable service. Construction materials, cement, etc., for the various dams and other water projects are given careful and expeditious handling under schedules that are rigidly adhered to, and, only a few months ago, the S. P. and the Santa Fe finished hauling materials to places of use along the Colorado river-Los Angeles aqueduct, meeting construction schedules to the minute, in one of the largest haulage jobs ever attempted.

Men Make the Wheels Go 'Round

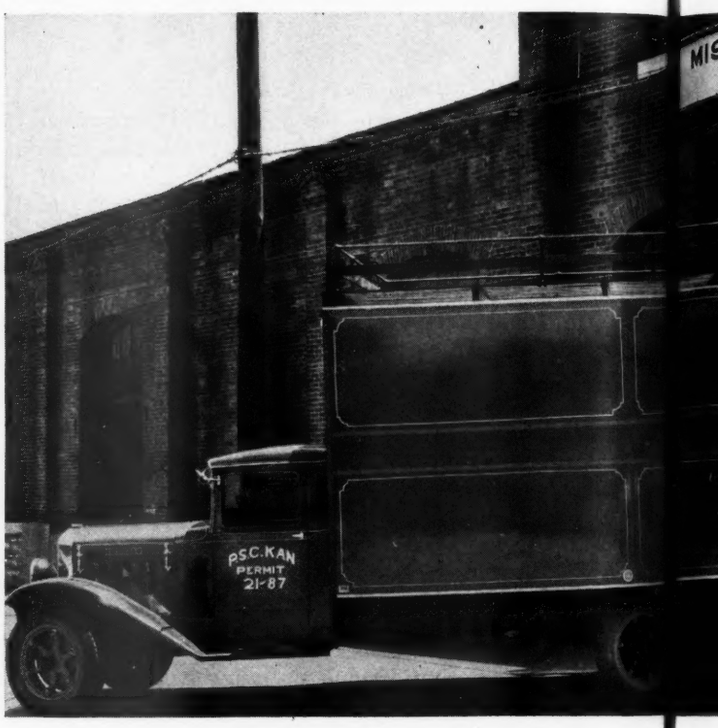
The details of the improvement in railway service present an imposing list and a stirring record of accomplishment. Specific information as to how this was done is given in the following articles. But no record of railway accomplishment is complete without a glance at the human side of the industry, as represented by the railway employees. When, some years ago, it appeared that the railways were losing their grip and traffic was slipping away to competitors without anything, apparently, being done about it, there was a natural spirit of laxity and discouragement among the railway employees, despite the fact that the large percentage of them are responsible citizens, proud of their jobs, and proud to be railroad men.

This discouragement did not last long. With the first signs that the railways were revising their services to meet the competition of other forms of transportation and to give the shipper what he wants, the effect on the employees was noticeable. They entered willingly and enthusiastically into the new spirit of courteous and efficient service. They are doing their best to make the service effective and are doing their part in giving the shipper what he wants.



Merchandise Handling Gets Face-Lifting

Universal pick-up and delivery service, faster freight handling methods and widespread use of highway trucks change the freighthouse picture



THE wind is whistling in off the lake and its three o'clock in the morning at the B. & O. freighthouse in Chicago, but already the "Dawn Brigades"—early crews of merchandise handlers—are at work on the platforms. They are unloading less-than-carload freight from cars that have come in on fast trains, and re-loading it into motor trucks, which will soon scatter about the city. All the way from Chicago and St. Louis to New York, and on other railways in all parts of the country, similar dawn brigades are at work, arranging for the early deliveries that modern industry demands. Similarly, at the end of the day, late gangs are to be found at work, accepting freight for movement out on fast trains the same night; freight which will be delivered at points up to 500 miles away early the following morning. A freighthouse is no longer a place that opens and closes to suit the convenience of the railway; now the hours are staggered to suit the convenience of the railway's customers—the shippers and receivers of freight.

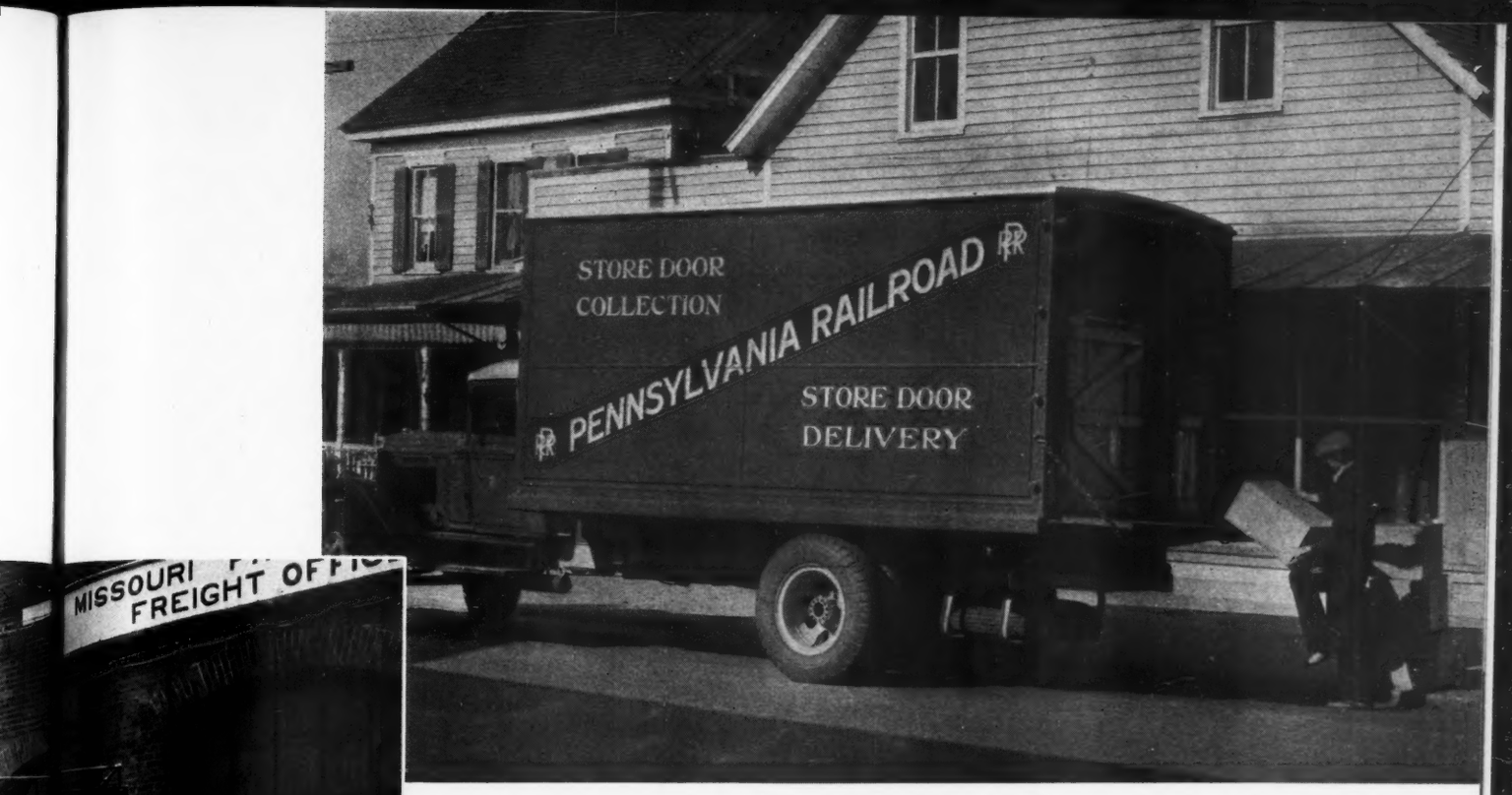
This is indicative of the changes in freighthouse operation that have taken place in recent years and they are highly important, for the freighthouse is the key to efficient merchandise handling, and, in keeping with the modernization of other railway operations, it is essential that the freighthouse keep pace with the changes in railway operations, and with the changed methods of merchandising among shippers. With inventories reduced to a minimum in almost every line of business, fast deliveries are extremely essential, and freight cannot stand on freighthouse platforms undelivered, as it not infrequently did some years ago, without immediate and often violent protests from shippers.

Pick-Up and Delivery Service

One of the most revolutionary changes in merchandise service has been the establishment of universal pick-up and delivery, which brings to shippers and receivers a complete door-to-door transportation service. This service, started locally on an experimental basis in the early 1930's, met with such success that no innovation in railway service has spread over the country with greater rapidity. No such sweeping and comprehensive innovation in railway service has ever been accomplished at such speed. One month, the fleet of trucks engaged in such service amounted to only a few thousand, scattered about the country, and, a few months later, the pick-up and delivery fleet had grown to nearly 100,000 highway units.

Pick-up and delivery service has made possible the concentration of the delivery and receipt of freight in fewer freighthouses, at which the merchandise is made up into trains, after being brought in from the shippers' platforms or outlying freight stations by motor trucks. This concentration permits trains to be assembled in much less time and insures earlier departure of such trains. The trap-car has practically disappeared from modern railway operation and the entire pick-up and delivery service, as well as the intracity transfer of merchandise between stations of the same or connecting railroads is now being handled by motor vehicles. These changes have been instrumental in improving the service materially and especially in giving quicker delivery to receivers.

Prior to the inauguration of universal pick-up and delivery service, certain terminals were already served by motorized transfers between the stations of connecting lines. This was true in St. Louis, where the Columbia Terminals has handled the transfer of less-than-carload freight between all railroads for a number of years. In Cincinnati, a system has been in operation for many years by Motor Terminals, of transferring the freight between stations in containers, which are loaded and unloaded on the freighthouse platforms and used as demountable truck bodies during the transfer through the city streets. Other terminals had somewhat similar ar-



Pick-up and Delivery Service Now Gives Shippers Complete Door-to-Door Transportation

rangements in effect, and, with the formation of many rail-highway co-ordinated systems throughout the country, the motor transport subsidiaries have taken over much of this work, also for the purpose of speeding deliveries.

Insofar as pick-up and delivery service is concerned, the Railway Express Agency is the largest individual contractor with which the railways do business. This company handles collection and delivery service for all lines in many cities in various parts of the country. In places like Cincinnati and St. Louis, where operations had already been set up for motorized transfer service, the facilities of the transfer company are being used for pick-up and delivery service by practically all lines in these two terminals. At still other terminals, one contractor handles all such work for one railway, and, at still others, practically all the cartage companies in town participate in this service. There are many arguments pro and con for each type of service listed above, but the volume of pick-up and delivery service for railway merchandise freight is indicated by a conservative estimate that nearly 100,000 motor trucks are today engaged wholly or for a majority of their time in railway pick-up and delivery service in this country.

All contractors in the larger cities have arrangements for enlarging their fleets by renting trucks when the occasion demands it, and this flexibility received and passed a test most successfully in the fall of 1939, when the sudden huge increase in business made it necessary to enlarge the fleet of pick-up and delivery trucks by an estimated 30 per cent. This expansion was accomplished so smoothly and easily that there were almost no complaints as to delays in picking up or delivering merchandise freight, despite the unusual and emergency circumstances that existed. In Canada, pick-up and delivery service is largely in the hands of the Canadian Pacific and the Canadian National express companies.

Problems of P. U. & D. Solved

Certain problems have naturally arisen in connection with pick-up and delivery service, but through experience and close study these have been met satisfactorily, insofar as service to the customers is concerned. Confusion sometimes existed at first as to how to get the shippers' calls to the truck drivers, but after a few months, regular routes were worked out for the trucks to serve all the larger shippers and truck dispatching systems have been established to meet the needs of the occasional shipper who telephones in to the freight station.

Great improvements have also been made in methods of spotting motor trucks at various points along the freighthouse platform so that the actual platform work at the freighthouse may be expedited and the distance of the hauls of the platform trucks cut down. The location of freighthouses with reference to adjacent streets and buildings has an important bearing on this problem, as well as the difficulty of taking care of the late afternoon rush. In many cases, platforms have been lengthened and driveways widened to relieve traffic congestion, but the solution depends largely upon local conditions and, as the necessary experience has been gained, much ingenuity has been displayed in working out the details of the new problems brought about by universal pick-up and delivery service. One factor that has aided in this, as in all other freighthouse operations, is the widespread unemployment for the last several years that has made a much higher type of employee available as freight handler or truck driver. Many of the latter employees are capable of soliciting freight intelligently and

Modern Packing Methods Eliminate Damage to Freight

of rendering services of various kinds to shippers and receivers.

The motor truck has also played a conspicuous part in the zoning system of handling merchandise, which is spreading on most railways in this country. This has been described in a previous article and a list of rail-highway co-ordinations by which the zoning is accomplished is given elsewhere in this issue. What it means in freighthouse operations, however, is that the number of transfer points has been materially increased. Formerly, large merchandise transfers were confined to the vicinity of large cities, where there is a constant and voluminous interchange of less than carload freight between connecting lines, and such transfers were frequently jointly operated by two or more railways.

The new transfers are being operated on quite a different basis. In their case, cars are loaded from the metropolitan centers to the zoning points. These cars contain freight for a number of local stations in the vicinity of the new transfer points, and, upon arrival there in the fast merchandise trains, they are cut out, spotted at the freighthouse platforms, and—usually in the early morning—the freight is transferred from cars to motor trucks, which, in turn, take the freight out to the local and branch-line stations for which it is destined, not infrequently saving from 24 to 48 hours in delivery as compared with the former method of handling in way freight trains. By this means the shipper enjoys the economy of rail haul for the major distance, and the convenience of truck delivery, with the advantage of speed in both operations.

Streamlining Platform Operations

It is of little benefit to operate a fast merchandise train over the road at high speed and then nullify this by delays in platform handling of the merchandise at the initial or terminal freighthouse. As a result, the increased speed on the road has been accompanied by a streamlining and a mechanization of platform operations. The use of power tractors for handling trucks has become more widespread, and the trucks themselves have been modernized in accordance with the latest designs for such equipment, so that the handling of material is made easier and it can be handled faster. Shocks to the loads are avoided in many cases by the use of rubber-tired

Below—The Freighthouse, in the Basement of the Huge Merchandise Mart in Chicago, Gives Shippers Prompt Service

Platform Handling Has Been Completely Streamlined by New Methods and New Equipment

wheels on the hand and power trucks, which also permits moving the trucks over the platform at greater speeds without damage to the lading. Proper packaging devices, such as steel straps, have played their part in streamlining freighthouse operation. Modern scales that permit of quick and accurate weighing have also been installed, to insure more rapid handling and to insure that exact weights are available for rating purposes.

Spot unloading speeds platform work materially, but, until the advent of pick-up and delivery service, it was not feasible in most freight stations because, under that system, freight for the same consignee would be scattered at various points on the platform and it was impracticable to ask the consignee to move his vehicle about several times on arrival at the freighthouse. However, with the pick-up and delivery trucks, and particularly those under railroad operation, this difficulty is eliminated and, in many locations, spot unloading is used, with an attendant speeding up of merchandise handling.

The zoning system previously described has resulted in heavier loaded merchandise cars, since they contain freight not only for the station to which they are destined, but also for the local stations served by truck routes as well. It is manifestly easier to unload the same amount of freight from one car than from several cars spotted up and down the platform, and this has resulted in shorter platform hauls and better operation in general. At least one railway has eliminated the rehandling of such freight at the local stations, by taking the rather revolutionary step of having its road trucks that haul the freight from the central transfer point to the outlying towns deliver it direct to the receiver's door, without having it pass through the local station at all. In many localities, there are operating difficulties that prevent this being done, but, where it has been done, it has resulted in a further streamlining of merchandise handling, by speeding up operations through the elimination of one handling of the freight across the platform of the local station.

The heavier loading of cars, together with the better class of freighthouse labor now available, has enabled many improvements to be made in the proper stowage of merchandise in the cars, and the many new packaging and loading devices now being manufactured and sold have also been of material assistance in cutting down damage claims on merchandise.

The use of hampers for mixed shipments, such as grocery mixtures, has also aided in speeding up the movement of merchandise, as well as reducing the damage claims.

L. C. L. Perishables

An outstanding improvement has been effected on many lines through the use of L. C. L. perishable containers. These open up large new fields for handling of such perishables by rail. The expense of operating a refrigerator car to a small station to transport a small quantity of perishables makes this service prohibitive in cost. As a result, much of this business has gone to highway trucks, where smaller refrigerator units are possible. With the development of a portable refrigerated container for railway shipments, however, this business is being won back to the rails, and, in many instances, new business is being created. An example of this latter is found in chocolate candy shipments to the Southwest. This was impracticable or prohibitively expensive by any means of transportation until recently but with the new containers, it is now possible to ship carloads of such candy to St. Louis, to break bulk there and be dispersed throughout the Southwest in the containers.

These containers for all classes of L. C. L. perishables are loaded in regular merchandise cars and handled at freight stations in the same manner as a regular shipment. At the start of this service, there was a consider-

able empty return movement of the containers, but, as the service developed, much of this has been eliminated, but in any event, the empty containers are easily handled and take up small space in a car. In many instances, where perishable loading is not available the containers are loaded with "dry" freight on what would otherwise be empty return movement. Many of the railways having rail-highway co-ordinated systems have supplemented this L. C. L. perishable service by providing refrigerated compartments in their highway trucks, so that all communities may have the advantage of protection for perishable shipments. There is a possibility now being explored of a considerable expansion of such service by the use of such containers in interline runs as well as locally on individual railroads.

Paper Work

In modern railroad practice, it is unpardonable to delay shipments awaiting completion of the paper work involved in their billing. To avoid this, freighthouse office equipment is undergoing as complete a change as freight handling equipment. Modern business machines are replacing antiquated equipment and much of the accounting work is being mechanized. There are many new devices on the market for making freight office work easier, including a machine for photographing waybills on 16 mm. film, so that a permanent record, occupying only a small space, may be maintained, and these films, with an enlarging machine, enable the billing to be handled promptly without delaying the shipments, since all necessary record and accounting work may be done later.

Teletypes are proving useful in transmitting information rapidly from place to place. Modern high-speed freight trains require such prompt transmission of billing that long distance teletyping has become a practical necessity in many places. Large installations of such machines have also been made at many places for broadcasting passing reports to freight traffic officers for transmission to shippers and receivers. The whole mechanism of tracing shipments has undergone a complete change and shippers are now supplied with much more prompt and accurate information regarding their shipments than ever before. One railroad broadcasts such information to its traffic representatives in more than 75 cities, and the location of the car or shipment is available within a short time after it has reached or passed certain key terminals. It is now customary for railways to provide 24-hour tracing and diversion services, certain transportation offices being manned in three eight-hour shifts, for the benefit of shippers and receivers.

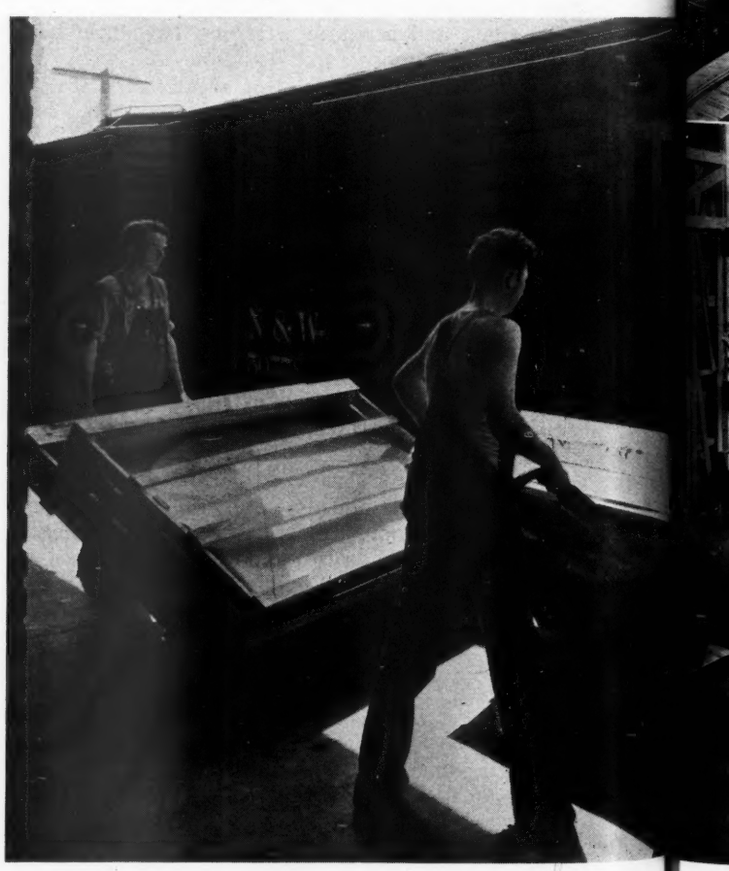
Simplified Billing

The whole process of waybilling and marking shipments is also in the process of being streamlined. Several roads have completely revised their waybilling methods in the last few years and these benefits are being passed along to the shippers. Certain railroads now accept grocery, drug and drygoods shipments on waybills containing only one item each, instead of requiring the shipper to list hundreds of items. This has been made possible by simplifying the rates and classification on intrastate shipments. Manifold billing is in use on many railroads, involving a special form which supplies all the many documents necessary for the transmission of a merchandise shipment, particularly in interline movement. An interesting innovation has been in successful operation on the Canadian Pacific for some time, where packages move on their marks only, and the necessary waybilling information is telephoned from one station to another. In many instances the benefits of improved waybill methods can be passed along directly to the shipper.

The higher class of employes now available, as previously mentioned, applies not only to freight handlers but to clerks in freight offices as well, and such clerks, when properly recruited and trained, are more amenable to instruction as to the proper methods of dealing with the shipping public. This has resulted in more accurate and courteous service in such offices. Many roads have been conducting successful campaigns for increased courtesy in the dealings that freight office clerks in certain positions constantly have with the shipping public. Studies of increased telephone courtesy and better letter writing have been widespread and are showing results on the many railways that have adopted these practices. The railways' competitors in the freight business, no less than in the passenger business, realize the necessity for courtesy in their dealings with their customers and these important studies are being made and policies put into effect for competitive reasons, although they have been proved to pay dividends in many industries other than the railway business.

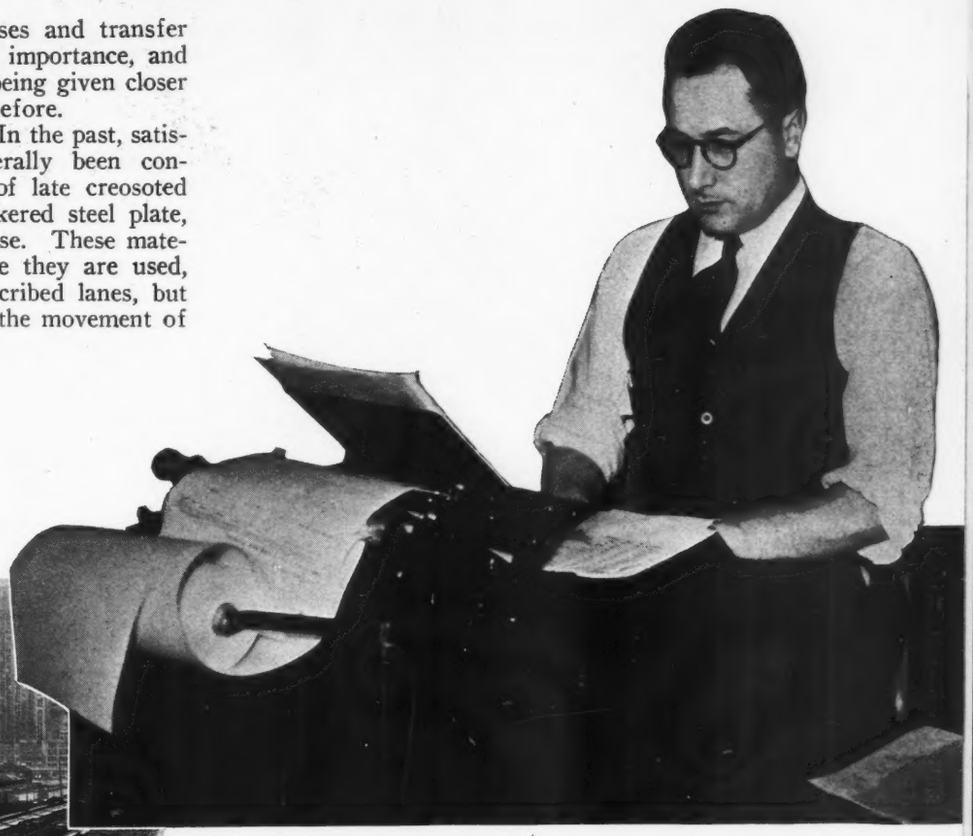
Improving Freighthouse Design

In addition to the streamlining of the personnel and equipment of freighthouses and freight offices, many improvements are being made in the engineering features of freighthouse construction, which contributes to freight progress. Obviously, the facilities provided for the handling of freight have a large influence on the effectiveness of the methods developed for accelerating the movement through freighthouses. For this reason, the



design and construction of freighthouses and transfer platforms are becoming of increasing importance, and details of design and construction are being given closer and more careful attention than ever before.

A smooth floor facilitates trucking. In the past, satisfactory trucking runways have generally been constructed of hard-maple flooring, but of late creosoted gumwood, creosoted wood block, checkered steel plate, concrete and asphalt are coming into use. These materials possess the advantage that where they are used, trucking need not be confined to prescribed lanes, but can follow any route, thus facilitating the movement of the freight through the house.



Improved Paper Work By Modern Machine Methods Insures That Shipments Are Not Delayed for Billing

Busy Scenes Characterize Metropolitan Freighthouses as the New High-Speed Overnight Trains Are Loaded

No item of freighthouse design has been subject to more improvement in recent years than doors, and none is more important, for they must protect shipments against damage by the elements and from theft and, at the same time, they must give immediate and complete access to those who make legitimate use of the freight facilities. Modern doors are of generous width and are designed to give a completely clear passageway, with ample headroom, between the interior of the freighthouse and house cars, motor trucks or exterior platforms.

Since most merchandise is easily damaged by water, freighthouse roofs must be water and weather-tight at all times. While this is a fundamental requirement for any roof, railway engineers are also selecting materials that have long life and low maintenance requirements. For obvious reasons, roofing that must be renewed at relatively short intervals or that must be repaired frequently, is completely unsuited for freighthouse roofs, since continuity of service may be interrupted as a consequence of making repairs to roofing.

Attention to all of these factors, including better personnel, improved equipment, and more modern designs have revolutionized freighthouse operation in recent years. The modern freighthouse is equipped to serve its patrons in a manner that would not have been possible only a few days ago, and it is geared to the tempo of the rest of the railway plant—high speed and courteous service.

Eliminating

SWITCHING has become a science, where hit-or-miss methods can not be tolerated, as a result of the changes in railway operation and service. As a result, the speeding up of road operations has been matched with an accompanying improvement in yard facilities and methods to produce the fast, smooth, through movement demanded in present day transportation service. This is true of the modern yard facilities of the individual railways, the various belt railways and interchange switching lines have also geared up the tempo of their operations to meet the speed of the trunk lines.

Formerly, the test of a good yardmaster was that he keep his yard reasonably clear of cars, with the result that, even under the best of circumstances, trains were frequently sent out from one yard at such times as to make their arrival at the next yard highly inconvenient for the operations there. This was no particular reflection on the yardmaster, who, with all possible desire to operate efficiently, could only have a knowledge of local conditions. But the change in service demands has brought about such a change in yard operating methods, that cars are not now simply shunted along from yard to yard at the convenience of some local supervisor, with the inevitable delays accompanying such an operation. Instead, the movement of cars and of trains is now considered from the standpoint of the system as a whole, and, where the occasion demands it, with reference to connecting lines as well. On connecting line traffic, the idea used to be to get cars on to the interchange tracks to save per diem, or simply to get them out of the way to clear a track; but now dovetailing schedules which assure prompt and continuous movement of the car without terminal delays are the rule rather than the exception.

Moreover, the yardmaster now has at his command much better tools than previously. Car retarders, improved steam locomotives, Diesel-electric switchers, efficient lighting and many other factors make the speedy switching that is demanded today much easier of accomplishment. Closer supervision of yard operations, tending toward smoother operations and the elimination of rough handling, has also changed the rough and ready yard methods that were fairly general in former times.

Main-Trackers

One of the most successful efforts to improve yard operation has been the inauguration of "main-trackers," that is to say, trains that keep to the main track in intermediate terminals instead of being broken up and reswitched at frequent intervals. This is a part of the new method of viewing yard operations from a system instead of merely a local standpoint, and, under this arrangement, it has been possible to speed up through trains materially. When cars are delivered to the railway from shippers or from connecting lines, they are now built up into main-tracker trains by means of preclassification for destination at the initial terminal, and, when the train is then made up, cars for each terminal are grouped in such a way as to permit set-outs and pick-ups to be made at intermediate terminals in a relatively short time, and without the necessity of yarding and breaking up the entire train at such intermediate points.

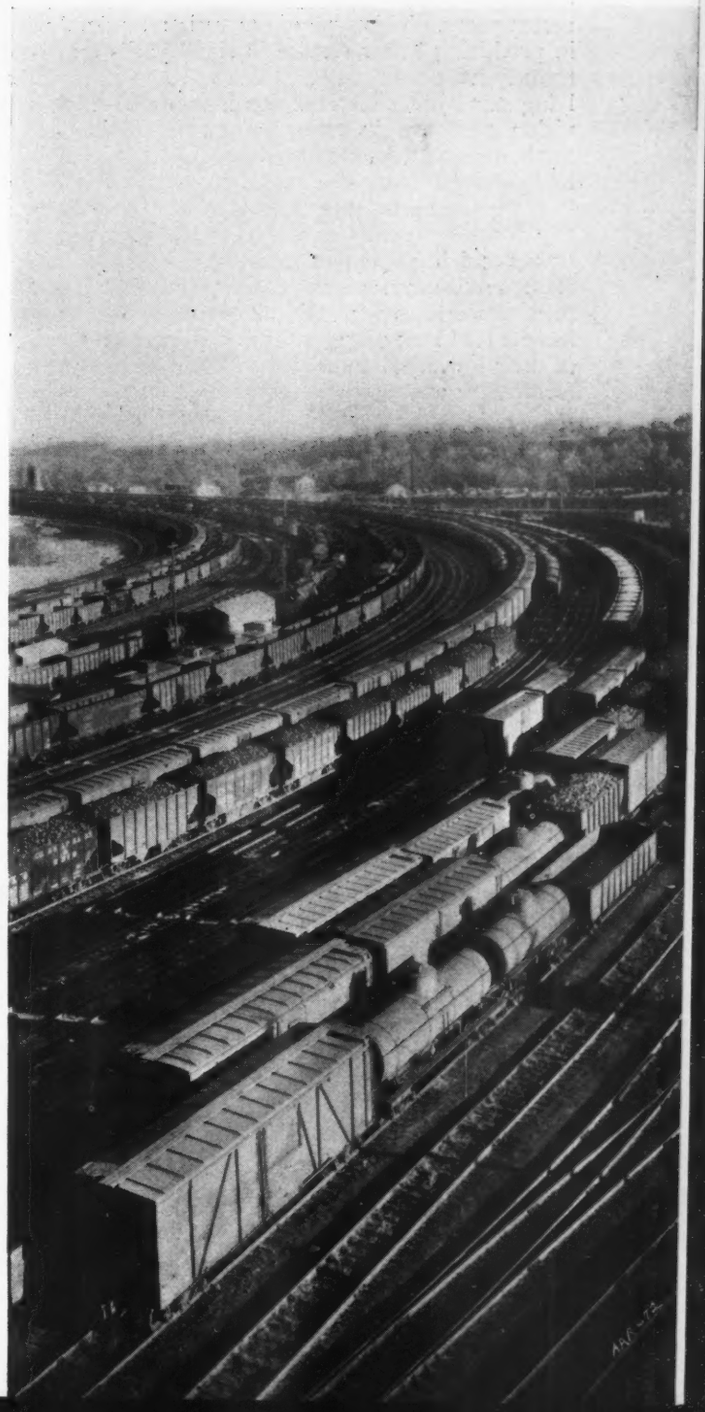
This operation, of course, involves considerably more switching at the initial terminal, but this additional time and expense are far more than offset by the advantages. Shippers are given much better service in that the train is speeded up and the lading is subjected to fewer switching shocks. Furthermore, from the standpoint of efficient operation within the railway plant itself, the intermediate yards are relieved of switching to an extent which more than compensates for the additional switching necessary at the initial terminal. Another factor involved is that the initial terminal is, in almost every case, larger and better equipped to handle switching and classification than the intermediate terminals, and, entirely apart from the desirable service features, the yard

...a Bottleneck

Terminal Delay

Efficient yard operation, equipment and facilities are playing a major part in promoting freight progress

...t and Day. Cars Go Roll-... Over the Hump in Major Classification Yards



costs per car from its initial to final terminal are reduced under the main-tracker system.

The fast overnight merchandise trains are a still further adaptation of the main-tracker principle. Many of these trains consist entirely of l. c. l. traffic and are not yarded, in the usual sense, from the initial to the final terminal. The MS-1 of the Illinois Central, for example, is made up of cars pulled directly from the freighthouse at Chicago, and the spotting of cars at the freighthouse platform is arranged in such a way that those intended for intermediate set-outs are in their proper position and so that, as the platform tracks are pulled, the train is consolidated and ready to run with a minimum of switching. En route from Chicago to Memphis, set-outs are made while crews and engines are being changed. On arrival at Memphis, the train moves directly to the downtown freighthouse without yarding. Only then is the remainder of the train, consisting of merchandise cars for New Orleans and other points south of Memphis, taken to a regular classification yard. In other words, the MS-1 is not yarded at any point on its journey, thus making overnight delivery possible at a distance of over 500 miles. Other fast merchandise trains are operated similarly and it is this elimination of unnecessary yarding that is largely responsible for the outstanding service that is being given to shippers by these trains.

Continuous Locomotive Operation

To improve their service to shippers by avoiding yard delays, the railways have also radically changed their methods of operating yard power. Changing locomotives at the end of each eight-hour shift was productive of many delays in yards. As better power became available, the railways evolved new operating methods whereby steam switching locomotives could be double-crewed

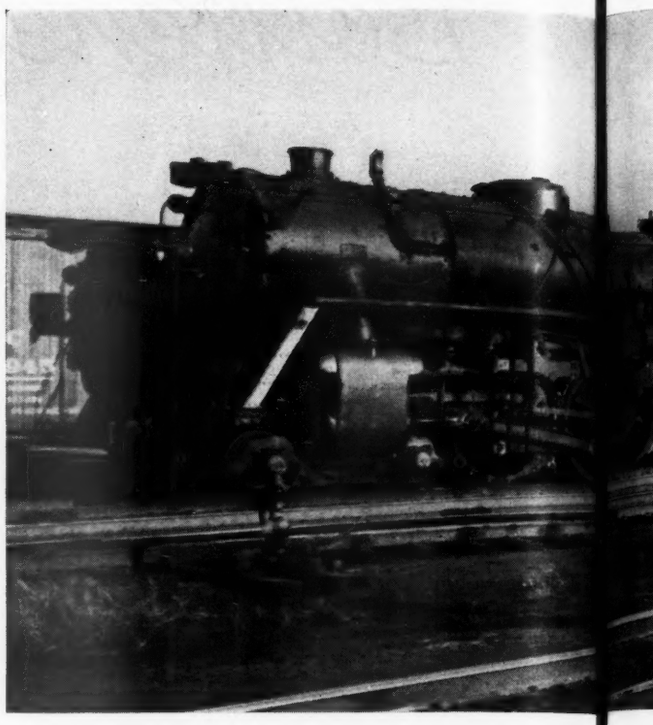
Modern Yard Operations Are Speeded Up to Match Fast Road Operations

or triple-crewed, and, in such cases, steam locomotives were kept in continuous operation for days on end in many yards, with only running inspection. Such locomotives were not sent to the enginehouse except at long intervals and such double and triple-crewing had the effect of keeping cars rolling through the yard by obtaining maximum use of the available power.

The Diesel-electric switching locomotive lends itself admirably to continuous operation and this advantage, taken in conjunction with the other advantages inherent in this class of power, is largely responsible for the wide acceptance of Diesel-electric power for yard operations. Diesel-electrics are now operated in yards throughout the country in ever-increasing numbers, although the use of this class of power is of comparatively recent origin. The ability of such locomotives to produce continuous, speedy yard movement, which, in turn, is translated into better service to shippers by the elimination of yard delays to cars, is indicative of the desire of the railways to adapt their service quickly and efficiently to the changing needs of their customers.

Small Diesel-electric locomotives of a much improved design have also been made available to the railways in recent years. This type of power is remarkably effective in producing better service in small yards and is an extremely important factor in eliminating delays, since outlying small yards increase the difficulty of efficient supervision and are, in many cases, productive of delays. Such small power units are also effective in light branch line service.

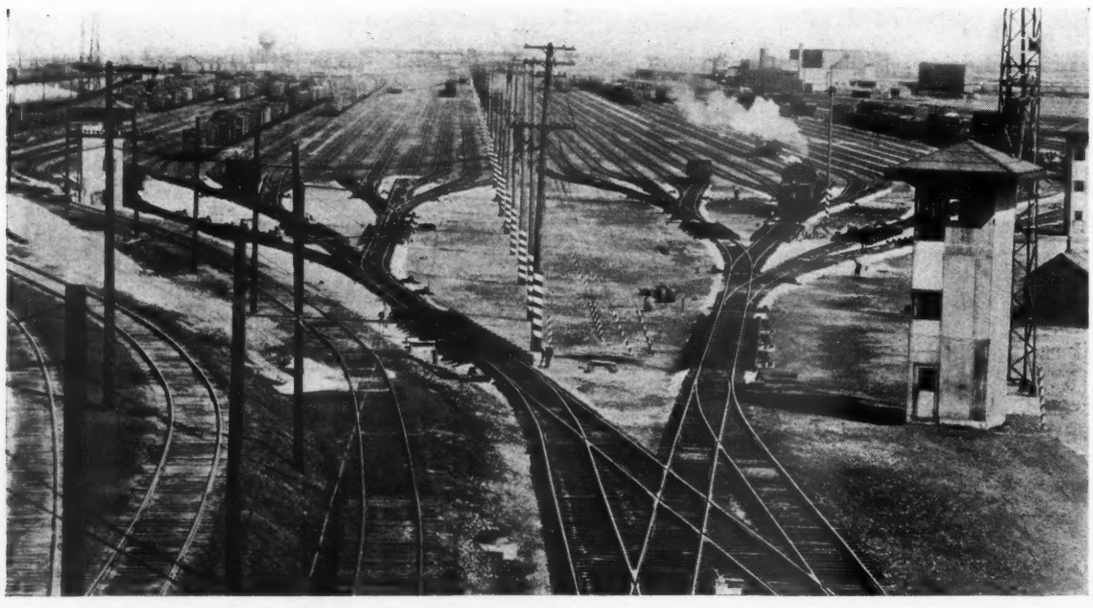
A further use of this class of power, ranging from 2½ to 35 tons capacity, is in handling cars on industrial tracks and in plant and factory yards. Here their constant availability, plus the fact that elaborate and expensive facilities for their maintenance are unnecessary, has enabled many large shippers to increase the efficiency of their industrial and plant switching. At smaller plant facilities, tractor units with automotive engines have also rendered good service in intra-plant switching, some of these units being sufficiently powerful to switch from eight to ten cars at one pull.



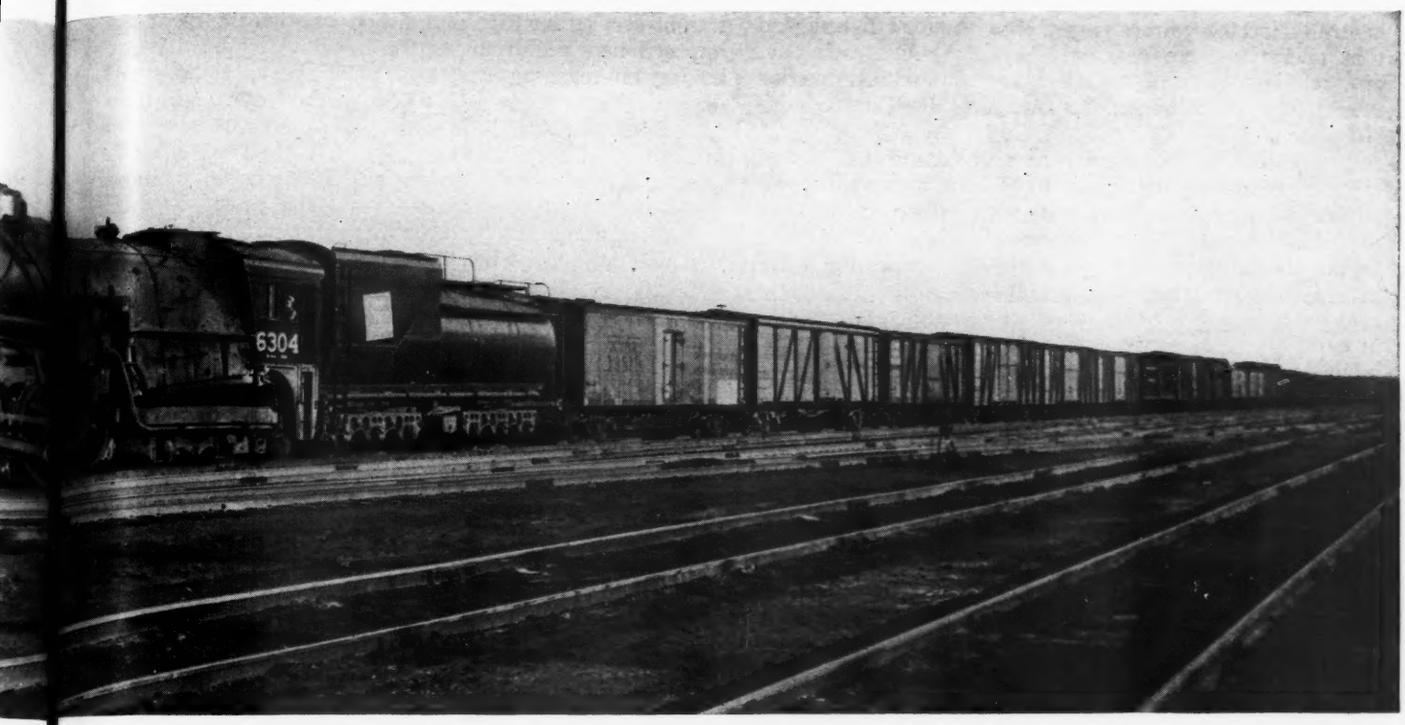
High-Speed Classification

For many years, the classification yard was the weakest link in the chain of railway transportation, and cars spent many hours in such yards, with attendant detriment to service. Now, however, cars roll over humps into classification yards for making up into outbound trains at speeds that would have seemed incredible only a short time ago. Railroads throughout the country have spent enormous sums in improving this feature of their service, by the installation of automatic car retarders, effective flood lighting for night operations, high-speed track scales and a variety of other devices pertaining to modern hump yard operation.

The delays of a decade or more ago were long considered as necessary evils, but recent improvements in yard operations and facilities have shown that such delays can be avoided and better service to shippers given by equipping a yard with proper facilities and giving it close supervision. For example, it might not seem that the use of a track motor car for conveying car riders



Car Retarders and Mode Yard Design Speed Clas fication



Main-Trackers Now Roll Through Intermediate Terminals Without Yarding

back from the yards to the summit of the hump could have much effect on the prompt movement of cars through yards, yet more than one railroad has stepped up its production of cars humped per hour by the use of modern track motor cars for this purpose, thus avoiding tieing up the yard while waiting for car riders to get back to the summit.

The classification yard is as susceptible to streamlined operations as any other part of the railway machine.

Faster Paper Work

Paper work in yards has also been vastly improved. In former years, the use of messengers and "number-grabbers" meant that yard operations could only be as fast as the often-lagging feet of these men. Not infrequently, cars stood around in yards waiting while some form of paper work was being done or while necessary information was being conveyed from one distant point in the yard to another. The installation of teletypes, pneumatic tubes and other devices for the prompt transmission of information from place to place within the yard, and of cameras for photographing waybills that might otherwise require laborious copying, has resulted in the practical elimination of paper work as a case for delays to cars.

Shippers themselves have also been of material assistance in speeding up yard operations. A co-operative spirit in ordering cars for placement at their loading platforms, ordering only sufficient cars to meet their current needs adequately, helps materially in simplifying yard operation problems. In at least one regional advisory board, a committee of shippers has been formed to assist in educating other shippers in this respect. As the prominent shipper who heads one of these committees recently expressed it: "The railways are and will continue to be the backbone of America's transportation. As shippers are keenly interested in getting good transportation, and in co-operating to improve the railways' yard operations, or any other form of railway operations, it seems to me that we are pursuing a course of action that cannot help benefiting us as shippers."

Docks and Lighterage

Docks for trans-shipment of freight between trains and ships, lighters, car ferries and a variety of other marine facilities, are in a sense, a part of railway yard facilities. As a matter of fact, during the construction of the San Francisco-Oakland bridge, the Southern Pacific extended its switching limits to the middle of San Francisco bay and made deliveries of construction materials by lighters to the piers in the water.

The lighterage and car-ferry service in New York harbor is by far the largest operation of this kind in the country. In the last few years this service has been completely renovated, so far as facilities are concerned, and modern docks and floating equipment have materially reduced delays. The overnight runs between New York and Pittsburgh and between New York and Buffalo would be of little use to shippers and receivers in the metropolitan area if the lighterage service had not been speeded up to match the fast time of these trains and give prompt service between the Manhattan-Long Island district and the New Jersey railway yards.

Car-ferry service across the Great Lakes continues to improve and many new Diesel-electric ferries of higher speeds and greater capacity have been installed. In the harbor district at Norfolk, Va., highway trucks operating across the bridges have supplanted much of the former lighterage service for l. c. l. freight, and in several instances, many hours are saved in deliveries.

Yard Facilities

Modern classification yard equipment includes power machines for operating the switches, retarders for controlling the speed of cars when passing down the hump and into the classification tracks, signals for directing hump operations and switching moves, all controlled from

centrally located towers, together with flood lighting so that operations can be carried on 24 hours each day, and teletype, as well as telephone communications for interchange of information, switching lists, train consists, etc.

In addition to this combination of equipment, certain track and yard arrangements have been found to be desirable to increase the speed with which cars move through the yard. The switches leading to the yard tracks are being arranged in groups to reduce the number of retarders required, and also expedite the operation by reducing the time-distance spacing between cuts of cars. Arrival yards, with their attendant delays and additional switching moves, are being dispensed with in some instances by providing two or more long tracks in approach to the hump on which arriving trains are pulled by road locomotives. Likewise by arranging yard tracks sufficiently long to hold an entire train or a half of a train, the departing road locomotives can, with one or two moves make up trains and depart from yard tracks directly, thus eliminating the previous departure yard. Recording machines, which reproduce waybills by a photographic method at the rate of 80 per minute, eliminate delay previously occasioned by copying information from such bills for records. Teletype equipment is used to transmit train consists and information concerning lading to points ahead on the route of the train.

In a yard equipped as explained above, the maximum classifying capacity of the yard is available at all times, with a minimum of operating expense. Cars can be classified at rates of 150 to 200 each hour, thus keeping abreast of arriving trains, and, by handling the last few arriving trains expeditiously, all of the departing trains or switching cuts ready for delivery are ready to move promptly.

In such yards, the average yard delay to cars is reduced in terms of hours as compared with previous operation, and, furthermore, the average operating costs per car handled are reduced—as much as 20 to 40 cents per car—the total savings representing a high percentage of return on the investments for the yard changes and improvements. The elimination of personal injury to switchmen and car riders previously employed is also an important factor. Of paramount importance, however, is the fact that better service is rendered to shippers by the avoidance of yard delays.

The switching yard has always been the heart of freight-train operation, and while the new streamlined freight service has not diminished its importance, it has imposed new requirements for handling traffic that are having far-reaching effects on yard operation and yard design. The effect of this new method of freight-train operation on yard design and operation has not been immediate; in fact, there seems to have been no effect at first. Yet, obviously, so radical a change in methods could not avoid producing an ultimate effect on yard operation, and it, in turn, on yard design. For reasons that will be given, when the effect of the changing transportation practices on yard design was felt, the impact came suddenly, not as a slow evolution, as so often happens, but as the result of an unforeseen development.

These Cars Pause Only Briefly in the Yard Before Rolling Onward

For many years important yards have been equipped with humps to facilitate classification switching. While the hump did shorten the time required to classify cars, compared with flat switching, it was not enough to offset other delays that were inherent in the large switching yards of the day, as they were constructed and operated. With the advent of the car retarder, which became available during the late twenties, but the acceptance of which was delayed by the onset of the depression, the whole situation changed.

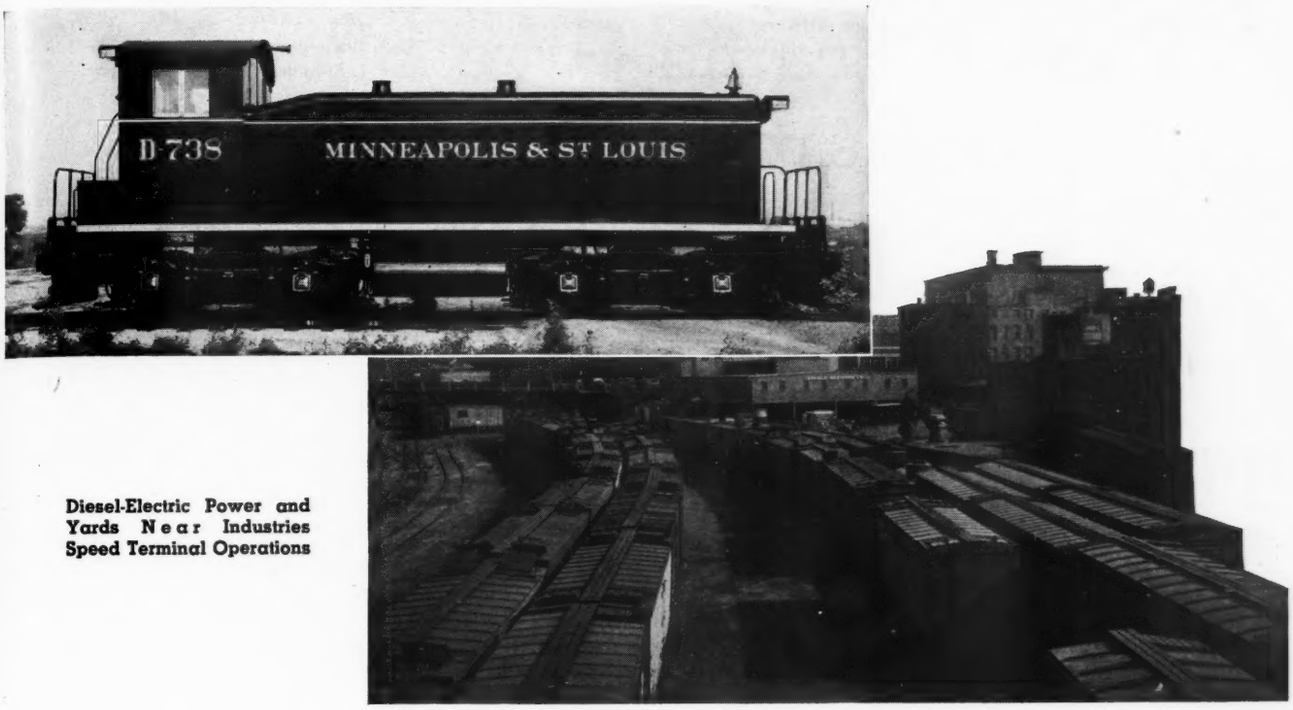
Car Retarder Speeds Switching

Where car-retarder installations were made, hump speeds were increased to such an extent that the existing facilities became inadequate for getting the cars to the hump and for keeping the classification and forwarding tracks clear. In other words, the capacity of the hump at once became greater than that of the channels through which the cars had been flowing to and from the hump. One experiences no difficulty in understanding that the impact of this unexpected development was severe; in fact, many yards that had been considered to be the last word in design at once became obsolete. While the new device did not change any of the fundamentals of yard design, it did change nearly all of their applications.

Car retarders eliminated the necessity for car riders and, therefore, the need for facilities to get them back to the hump; they allow far higher hump speeds, and thus increase the capacity of the hump; they permit complete control of the car from the crest of the hump until it enters any of the body tracks of the classification yard, and thus greatly reduces damages to lading, and this of itself has been a factor in permitting faster switching; through control of the speed of the car, it has become possible to increase the number of classification tracks almost indefinitely, thus eliminating or reducing the necessity for flat classification switching at the outgoing end of this yard.

Increased speed of classification switching has made it necessary to accelerate every other element of yard operation to synchronize the movement of the cars and thus produce a steady flow through the yard, until today, important yards are to all intents and purposes on a production basis. For best results in this respect, there must be no retrograde movement of the cars in the yard. In other words, modern yards are so designed that cars move forward constantly and as inexorably as automobiles do in the assembly line at the factory. To accomplish this, however, there can be no bottle-necks, and all channels must be adequate to pass the maximum flow of traffic.

Modern yards have auxiliary facilities, as icing, car-repair and transfer facilities, so located that they can be reached conveniently and with minimum delay. Icing facilities, too, are of such a character that the icing can be done in minimum time. Receiving yards are of ample capacity to care for the largest "fleet" of freight trains



Diesel-Electric Power and Yards Near Industries Speed Terminal Operations

that is likely to arrive in a limited time as a result of unavoidable road delays, and each track is designed to accommodate the longest train that is likely to be operated. Likewise, outgoing or forwarding yards are of sufficient length to accommodate the longest outgoing trains. Some roads are eliminating the forwarding yard, however, on the theory that every train should be started as soon as it can be made ready to go.

Yard Tracks Strong and Dependable

It was formerly considered that any rail and track accessories were good enough for a yard. The result of this attitude was that yard tracks were usually of light construction and generally poorly maintained. The further result was that many delays to cars occurred through yard derailments and other accidents. Today both engineering and operating officers recognize the necessity of building the same dependability into yard tracks that they are building into main-line tracks. As a result of this changed viewpoint, yard tracks are being laid with heavy rail, treated ties, manganese-steel frogs, heavy switches, tie plates and other track accessories comparable to these in main tracks.

Today, construction and maintenance engineers, and operating officers, have one common viewpoint with respect to yards, that is, that the design and operation shall be such that traffic will flow through the yard without restriction and that maintenance shall raise no obstructions against this steady flow. For reasons that require no explanation, not all yards have been reconstructed to permit the installation of car retarders and other aids to yard movements, but even in yards that are not modern, the best efforts are being directed toward the same objective that is, accelerated yard movement.

Furthermore, there is a definite trend on most roads toward concentrating classification switching in the larger yards, so far as this is practicable. The result of all of these developments has been to relegate intermediate terminals to a position of so much less importance that in not a few instances yards and engine terminals that were considered essential only a few years ago are being abandoned. In others, only such facilities are being retained as are necessary for local and short switching.

It should not be lost sight of all that while high speeds in the road movement of freight trains are necessary to enable them to reach distant destinations in minimum time, the saving in time thus made does not represent all of the saving that has been made in getting a car from the shipper to its ultimate destination. In not a few cases the reduction that has been made in the time required to pass through a yard may be greater than the reduction in the time of the road movement. A train running at high speed is spectacular and, therefore, attracts more interest, but the hidden routine movement of the cars before they are assembled in the train may be of equal importance, so far as the final result in early delivery at some distant terminal is concerned.

* * *

International-Powered Shop-Mule Distributes Local Freight at Southern Pacific's Spring Street Station, Los Angeles, Cal.

Faster Trains Give Shippers "Streamlined" Service

Getting freight over the road speedily made possible by improved operations, better signaling and a sturdy, modern roadbed

THE ex-railroader of only a few years ago would rub his eyes in great astonishment at the present day speeds of freight trains. The railroads have spent millions of dollars, even during the depression, to improve their service until the drag freight of "the twenties" has practically disappeared from the railroad scene and such commonplace commodities as coal and lumber are being moved more rapidly than many "red ball" commodities were a few years ago. From Florida to the North, for example, fruit and vegetable blocks now hustle along on schedules as fast as those of the fastest passenger trains between those points as recently as 1925. Overnight merchandise trains make early morning deliveries at places as much as 500 miles distant, not infrequently equalling or excelling the time of passenger trains between the same points.

All in all, the transportation map of the country has undergone an amazing shrinkage in freight as well as in passenger service in the last five years, and reductions of 24 to 48 hours in delivery time have become almost routine, not only for merchandise but for carload commodities as well. The list of high-speed freight trains shown elsewhere in this issue gives conclusive proof of this, and these trains comprise only the flagships of a large fleet of trains that are extending this new and more modern freight service in keeping with the faster tempo of all industry—and this without any diminution in the record for safety of person and parcel of which the railways may well be proud.

The salient factors which have made possible road movement at these markedly higher speeds are the elimination of as many stops as possible en route, better power and better rolling stock, increased attention to track and structure maintenance, the reduction of curvature, modern facilities for coaling and watering locomotives more quickly, modern signaling, improved train dispatching methods, etc. In all of these varied directions, the railways have made marked progress in the last five years, and they have all contributed to improved freight service. Outstanding in the list of recent expenditures to improve facilities and give better service was the extension of the electrification on the Pennsylvania, which now includes the freight as well as the passenger lines between New York and Harrisburg, Pa., and between Philadelphia and Washington, on which the huge new electric locomotives handle freight trains over these heavy traffic lines at much faster speeds than formerly.

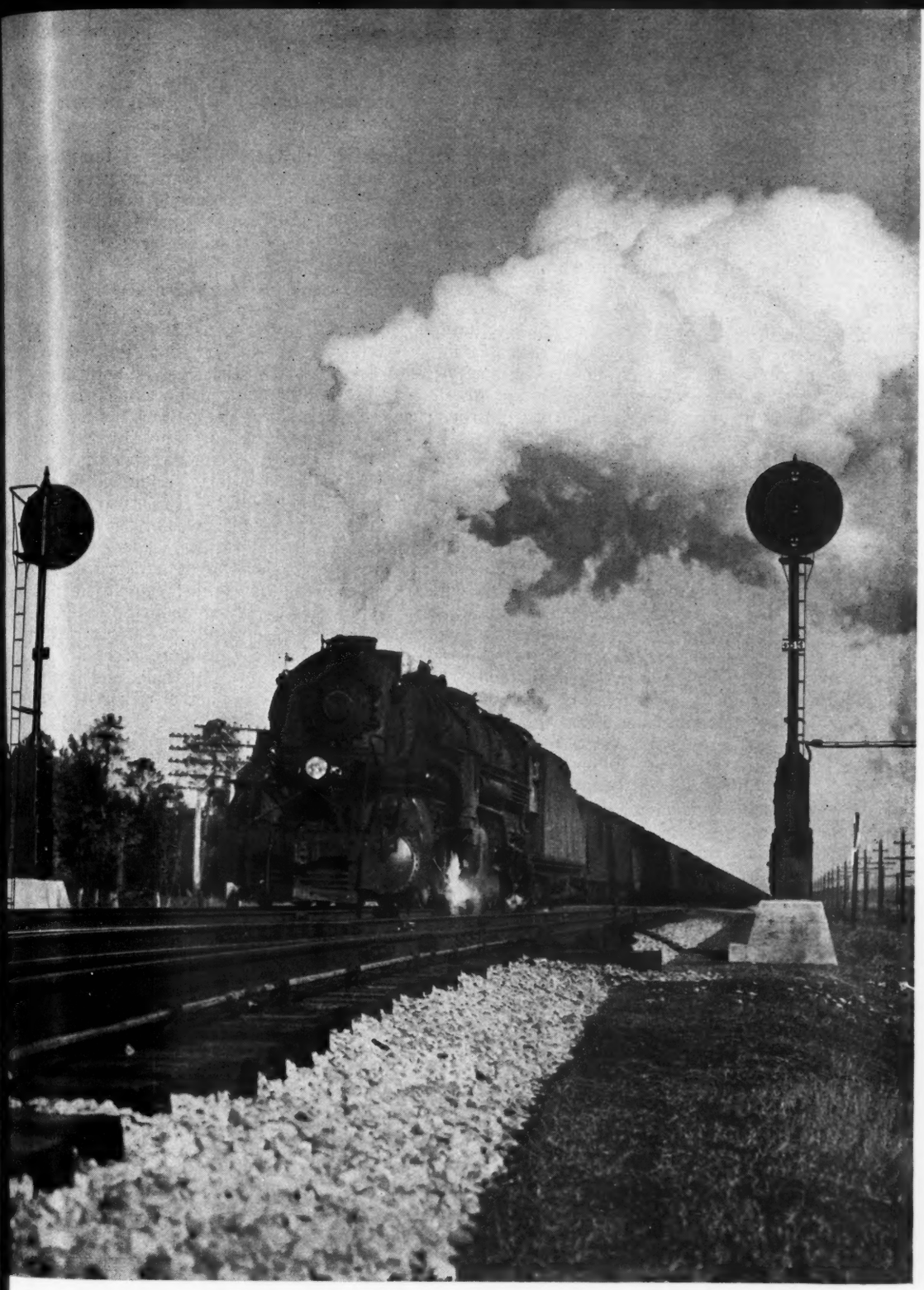
Keeping 'Em Rolling

The Grand Trunk Western has an overnight train from Chicago to Detroit that is popularly known as the "cuckoo train," for the reason that, if there is even so much as a few minutes delay in getting this train started, the supervisory officers are reported to "go cuckoo." There are many other trains throughout the country which could well receive the same nickname, for the naming of this train reveals a most important factor in high-speed operation, namely, proper supervision. These important, high-speed freight trains are receiving just as much attention from railway operating officers, and the executives, too, as the fastest streamlined passenger trains. The days when the yardmaster or other local dignitary was permitted to hold trains until tonnage, power and a lot of other things suited his convenience are definitely over. Competitive service conditions have changed all that, and freight train schedules are now watched and supervised so carefully, that on some railroads, everyone up to and including the president knows very promptly if any of these important trains are delayed.

The frequent stopping or slowing down of a through freight train is not only highly expensive and uneconomic, but it is also a fruitful source of delays as well. As described in this article and elsewhere in this issue, the maintenance, signaling and mechanical engineers have devoted much time and attention to the elimination of stops, and operating officers have been equally alert along these lines. Among the first efforts in this direction were the installation on many railroads of long locomotive runs to avoid stops and delays in changing engines. These began with efforts to run power over two or three engine districts but as experience increased runs up to 1,000 miles have become commonplace, and a fruitful source of delays was successfully overcome. This practice led naturally to the use of tenders with greater fuel and water capacity, to eliminate still other stops. The water capacity of a tender is limited by the problem of size, and to avoid unwieldy tenders, many roads have of late adopted the expedient of using auxiliary water cars, the extra expense of hauling this non-revenue car being far outweighed by the faster service made possible by the elimination of water stops.

"Maintrackers" followed closely after the installation of long locomotive runs and these trains are operated as their name implies, in that they hold to the main track in intermediate terminals instead of being broken up at each division point. The fast merchandise trains, many of which are operated from the freighthouse at the initial terminal to the freighthouse at the final terminal without yarding en route, afford further examples of how train stops are eliminated, with resulting benefits to the shipper in quicker deliveries.

A simple but effective means of avoiding slowing down through trains unnecessarily has been evolved on several railways. There are many small yards that are operated only one or two shifts daily, and, in some cases, only a few days each week. These yards formerly had



Efficient Operating Methods, Improved Signaling and Strong Roadbed Get Trains Over the Road Faster than Ever Before

permanent yard limit boards at each end, serving as a warning to through trains to proceed cautiously, as a switch engine might be encountered on the main track. By removing such yard limit boards during the time the yard is not being used, the through trains are now enabled to operate through these inoperative yards at their normal rate of speed.

The highway motor truck also affords the railways a means of avoiding train stops, particularly the fast merchandise trains. With a subsidiary trucking system to make deliveries to local stations, the number of through package cars from jobbing centers has been sharply reduced, because it is now possible to load cars to a zoning point and make deliveries by highway truck to the entire adjacent territory. In the past, important freight for local points was usually loaded on fast through trains in order to expedite its delivery, but the numerous stops introduced delays for these through trains, with resulting slowing down of service.

To eliminate such stops, it is now standard practice on an increasing number of railways to set up certain stations as concentration and distribution points and to load all merchandise for these stations and their contiguous area in cars destined to these zone stations. The through trains then set out these cars there for reworking and distribution of their contents to the local points by motor trucks. This system of concentrating railway car loading and unloading at certain specified points has been extraordinarily successful in eliminating delays on freight destined to branch line points. On many branches throughout the country, loss of traffic because of business conditions and competitive transportation agencies

had progressed to the extent where it became uneconomic and unprofitable to operate daily train service on these branches. By substituting trucks for branch line deliveries, however, it becomes possible to give daily deliveries to these points at a cost in keeping with the traffic and, even more important, to give consignees and shippers on these branch lines much quicker service.

Perishable Handling

The outstanding achievements of the railways in supplying America with fresh fruits and vegetables from remote areas of production affords an interesting commentary on the value of railway transportation. The improvements in transportation service for this commodity are discussed in detail elsewhere, and they show that by increasing the speed of road movement, the railways have widened the markets for growers to include the entire country. The railways have kept alert to the needs of the shippers in this respect and the operation of refrigerator cars in this country is today of a magnitude not approached anywhere else in the world, with the result that the American table is provided with fresh fruits and vegetables of all sorts in all seasons at reasonable prices. The effect of cheap and efficient transportation on costs is indicated by the comparison between American prices for these commodities and those in Europe, where a single orange costs 15 cents and a banana costs a dime, and both fruits are regarded as luxuries for the rich. Thus, in providing efficient transportation for perishables, which includes fast deliveries and the receipt of perishables in good condition, the railways have brought into being a vast industry that is unique to America.

The steady improvement in perishable transportation continues through study and experimentation, a new development being a car that is iced from top bunkers instead of end bunkers. This car gives an even temperature throughout its contents, with a variation of only a few degrees in any part of the lading. It has been in successful use in Canada for some time and similar cars are now being built in this country. Fan systems are also coming into wide use to keep even temperatures throughout end bunker refrigerator cars to insure delivery of perishables in good order and to quicken schedules by the elimination of intermediate icing stops.

Keeping Cars on the Move

Another source of delay to trains arises from bad order cars that have to be set out en route for repairs. Modern freight service demands that cars be kept moving and the present-day traffic manager no longer accepts a bad-order car as an excuse for not getting his freight on time. To eliminate bad order cars, the railways are now exercising much more care in the selection and preparation of cars before loading. Even with the strength and durability of the modern freight car, a certain number of bad order cars will always arise because of defects developing after the car is loaded, but, in modern railway practice the loading of a defective car is entirely inexcusable. Furthermore, the repair of loaded cars, which has such a direct bearing upon the speed of delivery, has been given scientific study and many repair tracks have been relocated nearer or more accessible to the train yard to save time in switching back and forth; the methods and machinery for the actual repair of cars have also been greatly improved.

The inspection of cars en route has long been another cause for delays since it is essential for reasons of safety and to avoid further delays that such inspection be made sufficiently thoroughly to prevent defects or to discover them if they are already present, while, at the same time, not holding the cars on the inspection tracks sufficiently long to cause undue delay to trains. In the case of fast merchandise trains, the problem is being simplified by the use of special equipment, designed and built for high-speed service. Even on such trains where specially-built equipment is not now in use, cars are being hand-picked from among the most modern cars available in the terminal for spotting at the freighthouse, to be loaded for the particular high-speed train in question.

American Products Rolling to Market via the Country's Best Transportation Agency

Mountains or Plains —the Railways Operate Smoothly Over Both

The trend toward the use of equipment specifically designed for high speeds is marked and will grow more so as existing equipment is replaced, but, until such time as this becomes widespread proper car inspection assumes a major place in road movement. To meet this situation, a number of roads have worked out a system whereby their cars are given a Class A, or 100 per cent, inspection at the initial terminal, and a Class B, or running, inspection at intermediate terminals. If a car has been properly inspected and prepared before loading, and the boxes are correctly packed and oiled, it will then travel to its destination up to 500 miles or more without further servicing, unless some defect occurs en route that can be discovered under running inspection. To obtain the advantages inherent in this system, however, the Class A inspection must be exceedingly thorough.

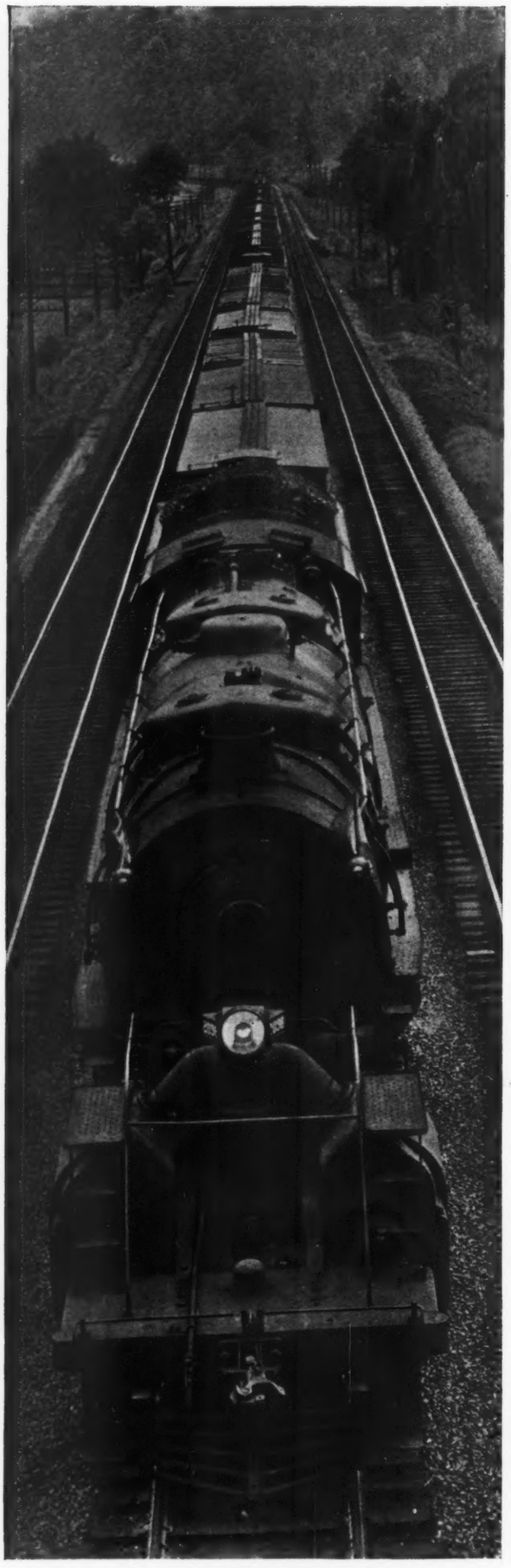
Signals Speed Trains

In previous years, passenger trains were given preference over freight trains, and the latter had to get out of the way of the passenger trains by entering passing tracks, using hand-operated switches to gain access thereto. Much time was lost entering and waiting on these sidings because of cumbersome manual block or time table and train order methods of directing train movements. By installing automatic block signaling on 65,232 miles of lines, the railroads have obviated many of the train stops and delays occasioned by manual block operation. The automatic block signaling also permits freight trains to operate at maximum permissible speeds with safety, thus increasing their average speed and on-time train performance regardless of weather conditions. One road has recently installed automatic signaling to accomplish these results on three lines, totaling about 200 miles, that are used practically exclusively for through freight traffic.

Also, the operation of freight trains at speeds up to 60 or 70 m. p. h., requires train-stopping distances in excess of those required for passenger trains. The inauguration of high-speed freight trains is, therefore, making necessary the respacing of automatic signals or the installation of signals with more aspects, involving heavy expenditures for this purpose. Furthermore, they are providing power-operated switches and signals, controlled remotely, at many of the passing tracks used most frequently, so that freight trains can pull in or out without stopping to open and close the switches, saving from 15 to 20 minutes time for each meet or pass.

On many extended territories and in one instance on an entire sub-division, the railroads are equipping all the passing track switches with these power machines, which, together with signals for directing train movements without train orders, are all controlled by an operator or dispatcher at a central point. By this arrangement, known as centralized traffic control, the switches are opened and closed by the dispatcher, enabling trains to head into or out of these sidings without the necessity for stopping. By means of his illuminated diagram, the dispatcher knows the location of each train on his territory, and, with this intimate knowledge, he can advance one train or another to make close meets and passes, rather than requiring them to wait for extended periods on some siding. Where long passing sidings or "lapped" sidings are provided, at least 50 per cent of these meets can be accomplished without either of the trains being required to stop. Furtheremore, flexibility of operation and track capacity are so improved that a sudden increase in the number of trains does not result in congestion, but, rather, permits the maintenance of on-time performance.

On some of the multiple-track lines, signals have been installed for train movements in each direction on all tracks, together with power-operated crossovers at various points, all included in a centralized traffic control system. As a high-speed train overtakes one of a lower speed, the slower train can be diverted to the other track to permit the faster train to run around it. Thus the slower train is kept in motion rather than being stopped in a passing siding until the faster train has



The Modern Fast Freight Train Presents a Dramatic Spectacle

passed, thereby saving 20 min. or more for the slower train. During the last ten years, the railroads have made about 195 installations of centralized traffic control on about 2,200 miles of track.

Since passenger trains were formerly given preference, the principal advantage of these centralized traffic control projects is to reduce the overall time of freight trains, the amount of time saved depending on the number of trains during peak periods. On several installations, each through freight train is saving from 1.5 to 2 minutes for each mile of territory so equipped. The accumulated benefits in reducing train stops and delays is an important factor contributing to faster overall train speeds.

Faster Freight Service—Faster Track

To insure on-time arrival of freight at the point of delivery, there must be no interference with schedules, for which reason the elimination of slow orders is being insisted on more and more, for any reduction in speed causes a loss of time that must be made up later by speeds above the average and these speeds must be maintained over distances far greater than those involved in the slow order. Regaining speed differs widely from regaining time lost. Speed may be regained in a few miles; it may be impossible to regain lost time. While high-speed passenger operation has already created a demand that slow orders be kept to the minimum, the development of streamlined freight service is creating an equally insistent demand that they be eliminated, because fast-freight trains experience more difficulty than fast passenger trains in making up time lost by reason of slow orders.

The effect of this demand is already in evidence in the revisions that are being made in the methods of doing work by both the track and bridge forces. Track gangs are being educated to do their work in such a way that the track is always ready for the passage of trains. For similar reasons, the bridge forces engaged in heavy repairs are constructing falsework of a design and strength that will permit the passage of trains at normal speed.

To a degree that few realize, curves limit the speed of trains. For this reason, they are being given more intensive consideration than ever before and reductions in curvature have been found to be necessary by practically every road that is operating high-speed trains. When the Atchison, Topeka & Santa Fe reduced its freight-train schedules between Chicago and Kansas City recently to make first morning deliveries, it was able to initiate this high-speed service only because it had reduced curvature across Illinois and through the rough country in Northern Missouri to facilitate the operation of its fleet of streamlined passenger trains. High-speed schedules can be maintained dependably only when sustained speeds are possible. Since curvature is one of the principal obstacles to sustained speed, some roads are reducing their curves to 1 deg. wherever practical.

In some cases where curvature cannot be reduced on the existing alinement, extensive revisions of alinement are being made to reduce the sharper curves and much more work of this character is in prospect.

Another means of saving delays to high-speed trains is the installation of spring switches at the ends of double tracks; at passing-siding turnouts; particularly where trains must be started on grades; and elsewhere where delays will be incurred by reason of stopping to close switches. Longer turnouts are another device to prevent delays by increasing the minimum allowable speed at

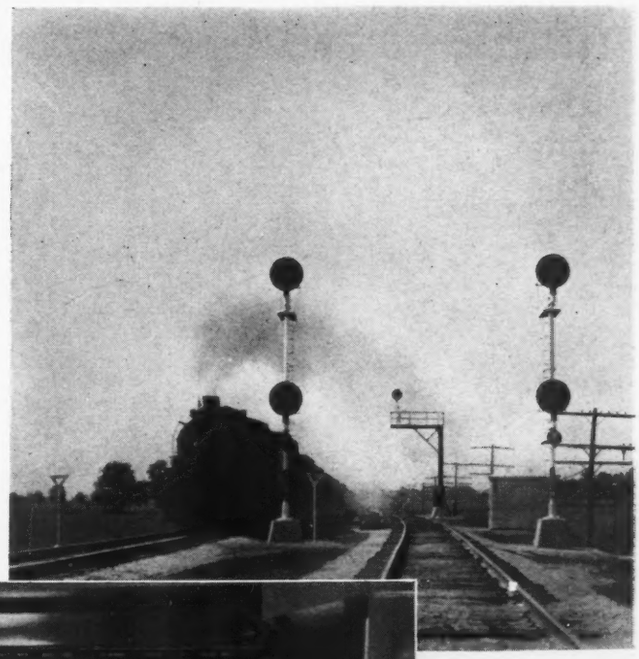
the ends of double track, at junctions and at interlocked crossovers where trains are diverted to other routes.

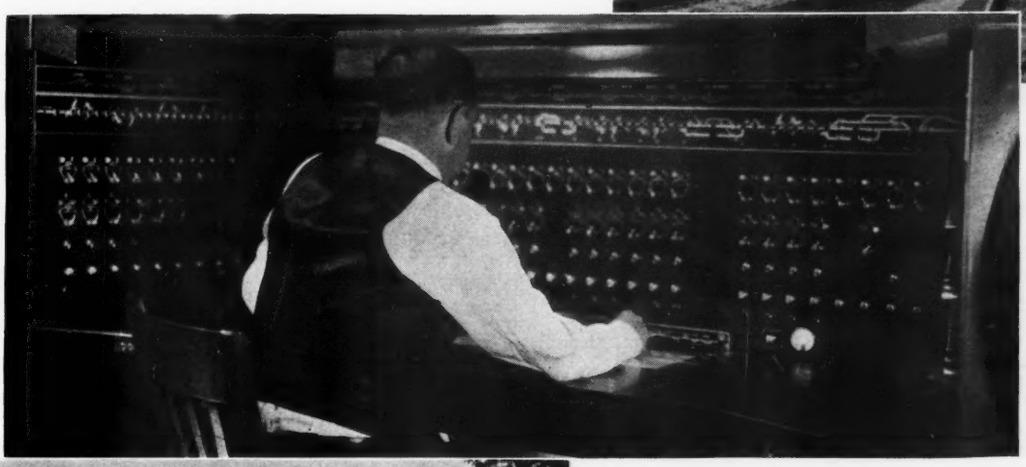
Dependability of Service Is of First Importance

Like the couriers of ancient Persia, trains in streamlined freight service must go through with clocklike regularity regardless of storms or floods or other disasters. It will avail any road little to shorten its schedules unless the service is dependable. Today's demand on transportation does not tolerate interruptions to service any more than it does the delays that have been discussed. However, the continuity of service that every road strives to maintain, regardless of the nature of the service it is performing, is founded on the dependability of track and roadbed.

Illustrating the importance that railway management is attaching to this dependability, after the great Mississippi river flood of 1927, during which every railway in the lower valley of the river was out of commission, wholly or in part, the Missouri Pacific, which was also damaged seriously by high water in many of the streams tributary to the Mississippi, considers that it made an excellent investment when it spent $17,500,000 to raise its tracks above any probable future high water and to establish flood openings of sufficient area to insure the continuity of its service in the event of a similar disaster at some future time, measures which have since rendered the carrier immune to flood interruptions of any consequence.

Another example of the lengths to which the railways are going today to insure dependable service, is the extensive reconstruction work that the Southern Pacific did last year in Soledad canyon near Los Angeles, Cal., following the disastrous flood in March, 1938, to place its line above any future high water and thus insure the continuity of its service under the worst possible conditions.

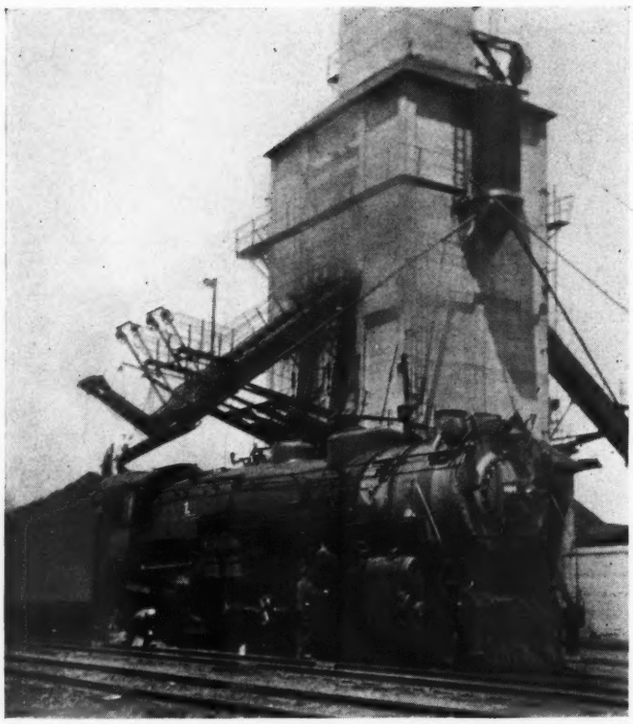




By Means of Centralized Traffic Control, a Dispatcher Controls the Operation of Power Switches and Signals for Directing Train Movements, Thus Saving Stops and Delays

On other lines of these and other roads, the building of dependability into the roadbed and tracks is a continuing process as evidence of the need for improvements arises. Because of this constant program of recent years dependability is today an outstanding characteristic of American railway service.

These measures to build dependability into the roadbed and track and the record which the railways have built up of continuous service under the most adverse conditions, stand in strong contrast to those of other forms of transportation. When the disastrous flood occurred in the Republican river in Nebraska several years ago, the Burlington rebuilt many miles of roadbed, track and bridges, and restored its service weeks before all highway traffic could be resumed, although the damage to the highways was relatively small by comparison. Furthermore, a severe snow storm that causes only minor delays to trains frequently interrupts highway transportation for days, as has happened on more than one occasion in recent winters. Likewise, although trains must run dependably on regular schedules, regardless of fog, rain,



Every Train that Takes Coal and Water from these Modern Facilities Saves 30 Minutes

snow, wind or other meteorological condition, any one of these may ground planes and interrupt air transport.

Good Track Essential to High Speed

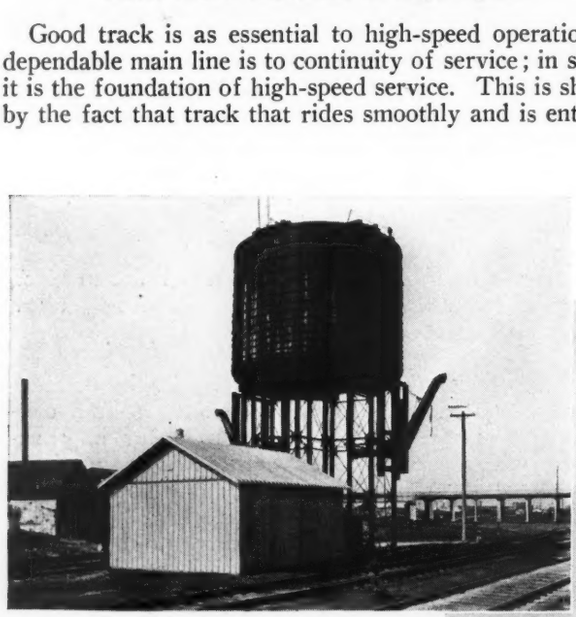
Good track is as essential to high-speed operation as dependable main line is to continuity of service; in short, it is the foundation of high-speed service. This is shown by the fact that track that rides smoothly and is entirely safe for speeds of 40, 50 or even 60 miles an hour, may be neither smooth riding nor safe at speeds of 80 to 90 miles an hour, and at higher speeds the effects of irregularities in the track increase more rapidly than the speed.

Under normal conditions, track does not fail suddenly, but gradually, under the impact of traffic. The rate at which this destruction progresses increases when either the speed or the volume of traffic increases. Because of its design and weight, freight-train equipment is more destructive to track than passenger equipment at comparable speeds. Track that receives inadequate attention deteriorates rapidly, regardless of the volume or speed of traffic. On the other hand, light or poorly constructed track cannot be maintained to the standard required for high speed, and under such speeds will tend toward rapid failure, largely regardless of the amount of labor expended upon it. In this connection, it is worthy of note that less than a decade ago only a relatively few freight trains exceeded an average speed of 25 miles an hour between terminals, yet today freight trains are in operation on schedules that call for sustained speeds of 70 miles an hour over long distances.

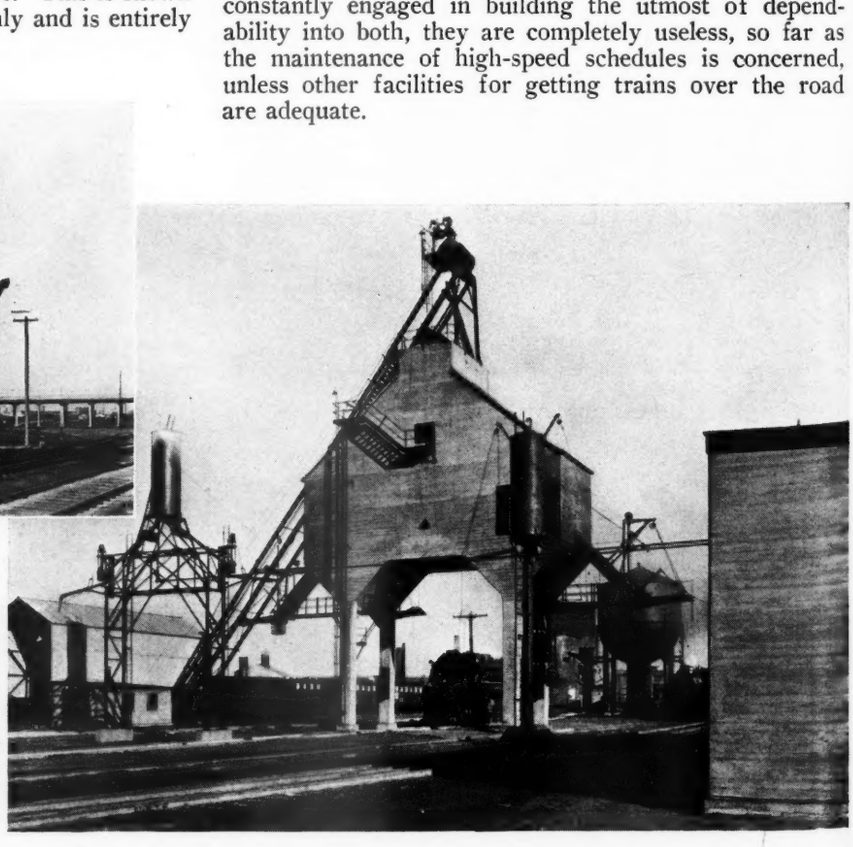
That the railways are constantly building stronger track to resist the destructive forces of high-speed operation is demonstrated by the fact that *capital* expenditures by the Class I roads for heavier rail alone have averaged more than $6,500,000 annually for the last five years, incidental to which they have installed improved rail joints, larger tie plates and treated ties and have made heavier applications of better ballast.

Has Many Ramifications

High-speed service is not merely a matter of coupling a locomotive to a train and starting it out on the road, for there are many ramifications to the maintenance of high-speed schedules. While a strong track and a stable roadbed are essential to high speed, and the railways are constantly engaged in building the utmost of dependability into both, they are completely useless, so far as the maintenance of high-speed schedules is concerned, unless other facilities for getting trains over the road are adequate.

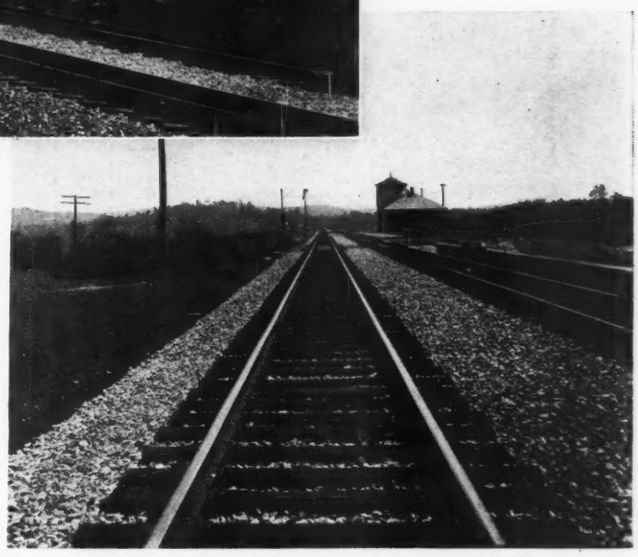


Water of Proper Quality Is Essential to Dependable Locomotive Operation



Modern Coaling Stations Speed Fueling in Freight Train Operation

Large Expenditures Are Being Made for Stronger Track—the Foundation of Railway Service



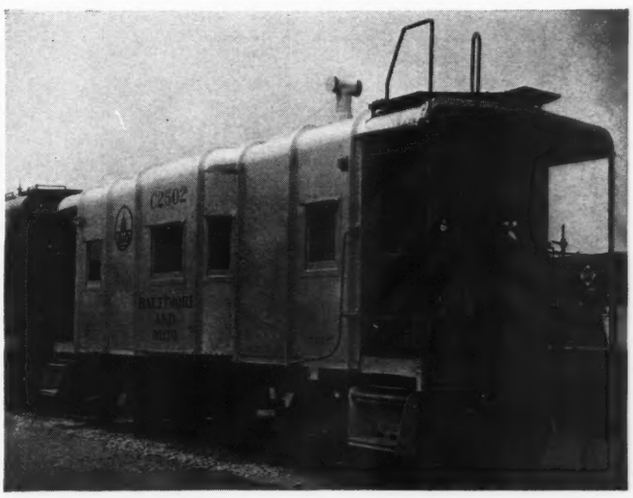
Among the many things the railways are doing to eliminate the delays and thus reduce the road time of trains, is to replace outmoded coaling and water facilities with others of modern design. An example of this is the facilities constructed a short time ago by the Chicago, Burlington & Quincy at Creston, Iowa, and Hastings, Neb., which not only reduce the time required to coal locomotives, but which allow water to be taken at the same time as the coal. Through this arrangement of modern facilities, an average of 30 min. is saved for every freight train passing through these points, or a total of one hour for all freight trains in operation between Chicago and Denver.

This effort to reduce delays to the minimum is also reflected in the revisions which the Santa Fe has made in its equipment for delivering water to locomotives. Formerly, water was delivered at the rate of about 1,500 gal. a min., and this was satisfactory so long as locomotive tanks were small. However, with the adoption of long locomotive runs and shortened schedules, these tanks have grown to a capacity of 22,500 gal., and at the old rate of delivery it required 15 min. to fill a tank. Through the installation of modern equipment the rate is now 5,000 gal. a min., and 10½ min. are saved at every water stop or approximately five hours between Chicago and Los Angeles.

Accelerated delivery of water constitutes only one item in the improvements in water service made by the railways to reduce delays to the minimum and to insure dependability of service. Neither long locomotive runs nor high-speed schedules can be maintained unless water that is satisfactory for boiler use is delivered to locomotives. Hard waters cause engine failures that may delay the trains directly involved from one to three hours, and since in their natural state most waters are too hard for boiler use, they must be softened before they become satisfactory.

The Illinois Central provides an excellent illustration of the constant effort the roads as a whole are making to insure the dependability of train service and the on-time performance of trains. As late as 1920, there was one engine failure on the Western lines of this road for every 5,000 locomotive miles. Today, by reason of water treatment, this has been reduced to one such failure per 10,000,000 locomotive miles. When it is recalled that every engine failure results in a delay of 1 to 3 hours for the train involved, the saving in time and the improvement in regularity of train operation are evident.

Road movement of trains is being studied from every conceivable angle, with the view of improving service and reducing schedules, and the railway supply manufacturers are co-operating wholeheartedly. Research as to facilities and methods has been productive of a revolution in railway transportation, and the efforts to increase the speed and dependability of road movement, as well as to remove causes for delay, have been translated into outstanding improvements in service which are being passed along to shippers.



A Baltimore & Ohio "Bay-Window" Caboose Finishes Up a String of Cars at the New York World's Fair Track Exhibit

Open-Top and Box Cars in Which New Structural Materials, New Methods of Fabrication, or Special Features of Design Have Been Used to Reduce Weight

Purchaser	No. cars	Class	Capacity, lb. Nominal	Capacity, lb. Load limit	Length, ft.	Length, in.	Features of construction effecting weight reduction*	Weight, lb.	Year ordered	Builder
Aluminum Ore Co.	10	Hopper	140,000	171,100	41	11	F	38,900	1931	Canton Car Co.
American Car & Fdry. Co.	1	Box	100,000	131,500	40	6	A-C	37,500	1938	Co. shops
Baltimore & Ohio	1	Hopper	190,000	193,200	41	3	C	57,840	1929	Co. shops
	1	Box	100,000	126,300	40	3	E	42,700	1934	Co. shops
	1	Hopper	100,000	137,800	32	2	A	31,200	1934	Co. shops
	1	Box	80,000	98,500	40	6	A	37,500	1934	Co. shops
	1	Hopper	100,000	137,000	35	0	A	32,000	1934	Co. shops
	1	Hopper	100,000	141,300	35	0	F	27,700	1934	Co. shops
	1	Box	80,000	102,000	40	7	A	34,000	1935	Co. shops
	1	Box	80,000	97,600	40	6	A-E	38,400	1935	Co. shops
	1	Box	100,000	122,300	40	3	E	46,700	1935	Co. shops
	1	Box	100,000	122,100	40	3	E	46,900	1935	Co. shops
	1	Hopper	100,000	136,000	32	2	A	33,000	1935	Co. shops
	1	Hopper	100,000	136,100	32	2	A	32,900	1935	Co. shops
	1	Hopper	100,000	135,900	32	2	A	33,100	1935	Co. shops
	1	Hopper	100,000	134,000	25	0	A	35,000	1935	Co. shops
	1	Hopper	80,000	100,800	29	0	E	35,300	1939	Co. shops
Bessemer & Lake Erie	100	Hopper	100,000	138,500	34	10	A-E[1]	30,500	1934	Pressed Steel
	200	Hopper	180,000	202,400	40	8	A	48,600	1936	Pressed Steel
	800	Hoppers	180,000	202,400	40	8	A-D	48,600	1936	Pullman-Standard
	1,000	Hoppers	180,000	202,400	40	8	A-D	48,600	1936	Pullman-Standard
	250	Hopper	140,000	164,500	40	8	A	45,500	1936	General American
	2	Hoppers	180,000	202,300	40	8	A-D	48,700	1937	Pullman-Standard
	500	Gondolas	100,000	122,200	..	..	..	46,800	1937	Greenville
	100	Box	100,000	133,200	40	6	A-C	35,800	1938	Pullman-Standard
	750	Hopper	140,000	164,400	40	8	A	45,600	1936	American Car & Fdry.
	500	Hopper	140,000	164,300	40	8	A	45,700	1936	American Car & Fdry.
	1,000	Hoppers	180,000	202,300	40	8	A-D	48,700	1939	Pullman-Standard
	500	Gondola	100,000	122,000	46	0	A-D	47,000	1939	Pressed Steel
Birmingham Southern	100	Box	100,000	129,400	40	6	A-D	39,600	1936	Pullman-Standard
	100	Hopper	140,000	174,000	30	3	A-C	36,000	1939	Pullman-Standard
Chesapeake & Ohio	5	Hoppers	100,000	132,800	33	6	A-D	36,200	1935	Bethlehem
	10	Hopper	100,000	134,400	33	6	A	34,600	1934	American Car & Fdry.
Chicago & North Western	200	Auto box[2]	100,000	112,900	50	6	B	56,100	1937	Mt. Vernon
	300	Auto box	100,000	117,900	50	6	B	51,100	1937	Mt. Vernon
	500	Hopper	140,000	158,400	..	..	B	51,600	1937	Pressed Steel
	300	Box	100,000	119,200	50	6	B	49,800	1939	Mt. Vernon
Chicago, Burlington & Quincy	5	Hopper	100,000	138,500	34	10	A-E[1]	30,500	1935	Pressed Steel
	250	Auto	100,000	114,500	51	8	A	54,500	1936	Co. shops
	1,000	Box	100,000	124,900	41	9	A	44,100	1936	Co. shops
	1,500	Gondola	100,000	125,300	43	1	A	43,700	1936	Co. shops
	400	Hopper	100,000	130,600	35	1	A	38,400	1937	Co. shops
	250	Auto	100,000	116,200	51	8	A	52,800	1937	Co. shops
	600	Box	100,000	125,300	41	9	A	43,700	1937	Co. shops
	300	Gondola	100,000	126,400	43	1	A	42,600	1937	Co. shops
	100	Hoppers	110,000	130,400	35	1	A	38,600	1937	Co. shops
Chicago Great Western	5	Hoppers	140,000	164,100	41	0	C-E	45,900	1930	Pullman-Standard
	50	D. S. box	100,000	133,000	40	6	A-C	36,000	1937	Pullman-Standard
Chicago, Milw., St. Paul & Pac.	500	Auto-box	100,000	120,600	50	6	A-C-E	48,400	1937	Co. shops
	500	Auto-box	100,000	121,700	50	6	A-C-E	47,300	1936	Co. shops
	500	Auto-box	80,000	94,800	40	6	A-C-E	41,200	1936	Co. shops
	83	Box	100,000	126,200	40	6	A-C-E	42,800	1939	Co. shops
	1,000	Box	100,000	126,200	40	6	A-C-E	42,800	1939	Co. shops
	105	Box	100,000	126,200	40	6	A-C-E	42,800	1939	Co. shops
	2,000	Box	100,000	126,400	40	6	A-C-E	42,600	1939-40	Co. shops
Delaware & Hudson	1	Hopper	80,000	103,300	28	0	A-C-E	32,700	1936	Co. shops
Delaware, Lackawanna & Western	500	D. S. box	100,000	124,800	40	6	A	44,200	1939	Magor
	500	Hopper	100,000	130,800	34	0	B	38,200	1939	American Car & Fdry.
Denver & Rio Grande Western	400	Box[3]	100,000	126,500	40	6	A-D	42,500	1939	Pressed Steel
	100	Auto-box[3]	100,000	124,500	40	6	A-D	44,600	1939	Pressed Steel
	50	Gondolas	140,000	151,300	65	0	A	58,700	1939	Pressed Steel
Duluth, Missabe & Iron Range	50	Hopper	140,000	162,000	..	..	..	48,000	1936	Ryan Car Co.
Elgin, Joliet & Eastern	200	Gondolas	100,000	126,100	48	6	A	42,900	1936	Mt. Vernon
	200	Hoppers	100,000	130,100	34	9	A	38,900	1936	Mt. Vernon
	300	Hoppers	100,000	129,800	34	9	A	39,200	1939	Gen. American
	500	Gondolas	100,000	126,100	48	6	A	42,900	1939	Mt. Vernon
	600	Hopper	100,000	130,000	34	9	A	39,000	1939	American Car & Fdry.
	300	Hopper	100,000	129,800	34	9	A-D	39,200	1939	Pullman-Standard
	300	Hopper	100,000	129,700	34	9	A	39,300	1939	Ralston Steel Car
General American Transp. Co.	2	Box	100,000	132,200	..	..	A-C-E	36,800	1938	Co. shops
Kansas City Southern	50	Box	100,000	121,600	50	0	A-D	47,400	1936	Pullman-Standard
Lehigh Valley	500	D. S. hoppers	110,000	128,300	31	0	D	40,700	1939	Co. shops
Mt. Vernon Car Mfg. Co.	1	Box	100,000	132,600	40	6	A	36,400	1935	Co. shops
New York Central	78	Hopper	110,000	132,100	31	11	B[4]	36,900	1936 and 1940	Co. shops
New York, Chicago & St. Louis	200	Box	100,000	130,700	40	6	A-C	38,300	1939	Pullman-Standard
Norfolk & Western	2,000	Hoppers	110,000	130,500	31	0	D-E	38,500	1936	Co. shops
	4,500	Hopper	110,000	130,500	31	0	D-E	38,500	1937	Co. shops
	5,000	Hopper	110,000	127,900	31	0	D-E	41,100[5]	1939-40	Co. shops
Northern Pacific	200	Hoppers	100,000	128,700	33	0	D-E	40,300	1940	General American
Pennsylvania	1	Box	100,000	127,400	40	6	E	41,600	1936	Co. shops
Pere Marquette	100	Box	100,000	130,700	40	6	A-C	38,300	1939	Pullman-Standard
Pittsburgh & Lake Erie	5	Hopper[6]	100,000	137,200	34	10	A-E	31,800	1935	Pressed Steel
Pressed Steel Car Co.	1	Hopper	100,000	138,500	34	10	A-E[1]	30,500	1934	Co. shops
Pullman Railroad	1	Box	100,000	134,800	40	6	A-C	34,200	1935	Pullman-Standard
	1	D. S. box	100,000	133,800	40	6	A-C	35,200	1936	Pullman-Standard
Rustless Iron Corp. of America	1	Hopper	100,000	135,900	35	0	A	33,100	1935	Ralston Steel Car
Texas & New Orleans	1	Gondola	140,000	161,900	..	..	G	48,100	1937	American Car & Fdy.
Union Pacific	50	D. S. box	100,000	133,400	40	6	A-D	35,600	1937	Bethlehem
	50	Box	100,000	133,000	40	6	A-C	36,000	1937	Pullman-Standard
	400	D. S. auto[3]	100,000	118,300	50	8	A-D	50,700	1937	Co. shops
	200	D. S. box	100,000	121,300	50	8	A-D	47,700	1937	Co. shops
	100	D. S. auto	100,000	117,700	50	6	A-D[7]	51,300	1937	Co. shops
	1,900	D. S. box	100,000	129,500	40	6	A-D	39,500	1937	Co. shops
	50	D. S. box	100,000	131,000	40	6	A-D	38,000	1937	Co. shops
	1,900	D. S. box	100,000	129,200	40	6	A-D	39,800	1939	Co. shops
	100	Box[8]	100,000	124,800	40	6	A-D	44,200	1939	Co. shops
	1,500	D. S. box	100,000	128,500	40	6	A-D	40,500	1940	Co. shops
Union Railroad	520	Hopper (coke)	100,000	126,600	40	2	A	42,400	1935	Co. shops
Wheeling & Lake Erie	200	Box	100,000	130,300	40	6	A-C	38,700	1939	Pullman-Standard

*Source of weight saving:
A—High-tensile steel
B—Partially high-tensile steel
C—All welded
D—Partially welded
E—Special features of design
F—Aluminum alloys
G—Partially aluminum alloys

[1] Hollow axles
[2] With auto loaders
[3] Equipped with Duryea cushion underframe
[4] Original flat sides and hopper construction replaced with panel sides and hoppers of alloy steel in general repairs
[5] Thickness of end and slope sheets increased from ¼ in. on earlier cars to ⅜ in.
[6] Same as the Pressed Steel Car Company's hopper car, but equipped with empty and load brake and solid axles
[7] End doors, center loading rail
[8] For high-speed merchandise service

Big Possibilities of Freight-Car Weight Reduction

Ten per cent of cars ordered last year weigh less than limit recommended for single-load brakes

THE possibilities offered by the reduction of the weight of freight-train cars have been a matter of growing interest among the railroads and car builders for more than ten years. In 1929 the Baltimore & Ohio effected some saving in the weight of a 90-ton hopper by the extensive employment of welding in its fabrication. In 1931 ten 70-ton hopper cars, the bodies of which were built of aluminum alloy, were turned out for the Aluminum Ore Company with a weight of 38,900 lb. each. During the same year five 70-ton hopper cars were built for the Chicago Great Western by the Pullman Car and Manufacturing Corporation, the weight of which were kept down to 45,900 lb. by a special design and complete fabrication by welding. **With the advent of the high-tensile alloy steels, which first came into use in 1934, began the development of cars of reduced weight, in many of which the new materials were combined with special designs adapted to welding and with truck castings of alloy steel. Weights were thus brought down so that ratios of pay load to gross load of over 80 per cent were attained in hopper cars and a fraction under 80 per cent in box cars.**

During the early years of the availabilty of the new stronger structural materials, the price differential was such that the first cost of cars in which these materials were extensively used ran to several hundred dollars more than that of standard equipment of the same capacity built of carbon structural steel. There was, therefore, the need of careful evaluation of the economics of reduced weight and a number of studies were made to determine the value of weight reductions under various conditions. In 1933 such a study was made by A. F. Stuebing.* The formula developed by Mr. Stuebing was based on a careful study of the incidence of weight reductions on the operating expense accounts indirectly affected as well as on those directly affected. Applied to the operating averages and expense totals of 1930, this study indicated an average reduction in expense per ton of weight saved per car per year of about $18.

The Mechanical Advisory Committee, in its report to the Federal Co-ordinator of Transportation in 1935, included a section in which this problem was dealt with at length. The method arrived at by the committee dealt only with the expense accounts directly affected by the reduction in tare weight and increase in capacity of freight cars, with a 10 per cent allowance to take care of the less easily evaluated indirect effects. Applying the Mechanical Advisory Committee's ton-mile and car-mile unit costs to the operating averages used by Mr. Stuebing, this formula develops an operating saving per ton per car per year of about $13. Applying the formula itself to the same conditions, the result is between $10 and $11. K. F. Nystrom, in a paper before the Western Railway Club,† uses an estimate of $12 per ton saved per car per year.

The various formulas provide for the consideration of the specific conditions of car loading and train loading under which the cars are operated. The figures here set forth are, however, the result of applying general averages. Reduced to the value of mills per gross ton-mile saved, the various estimates range from about 1.0 to 1.8.

While there is no general agreement among railway officers within this range, there seems to be a growing belief that an operating saving lying somewhere within this range is, in fact, effected by reduced tare weight, with no allowance for a possible saving in the cost of maintenance of cars built of the high-tensile corrosion-resistant materials.

Since these studies were first made, the price differential of the new materials compared with the carbon structural steel has changed so that the difference in cost of the car in which weight reduction has been effected to the full extent practicable by the use of the new materials has been greatly reduced; in fact, in some cases it has completely disappeared except for the additional cost of the empty-and-load brake when that is applied. In broad terms, therefore, it may be said that **at present the empty-and-load brake, or at least the attitude of the railroads toward its use, becomes the major factor in determining whether weight reduction is to be utilized to the fullest practicable extent or is to stop at a point which limits the ratio of pay load to gross load at 76 per cent.** Under the recommended braking ratios a reduction of weight beyond that point calls for the application of the empty-and-load brake.

In the table of open-top and box cars, in the construction of which weight has been saved by the new structural materials and welding, are listed a total of nearly 40,000 freight cars which have been ordered during the years since 1929. About 29,000 of these cars provide a pay-load-to-gross-load ratio higher than 76 per cent; i. e., weigh less than the minimum recommended for the use of the single-capacity brake. Among them are cars in which the tare weight is low enough to provide a pay-load-to-gross-load ratio of over 80 per cent in the case of open-top cars and a fraction less than 80 per cent in the case of box cars. Orders for cars within the empty-and-load-brake weight range amounted to about 9 per cent of the total number of cars ordered for domestic service in 1936, 13.5 per cent in 1937, less than one per cent in 1938, and 10 per cent in 1939. Several thousands of these cars are actually operating with single-capacity brakes.

While there is a very definite economic value to reduced tare weight, irrespective of the question of freight-train operating speeds, it seems evident that as these speeds tend to increase, the importance of reduced freight-car weight will become greater. As the demands of the shippers for more refined service increase, train movements, as well as freight cars themselves, tend to become more specialized. This means that

(*Continued on page 946*)

* See *Railway Age*, September 3, 1933, page 339.
† See *Railway Age*, November 26, 1938, page 770.

Freight Car Trucks for Speed

Spring snubbers play an important role—New truck designs will incorporate improvements based on the A. A. R. truck tests which are soon to be released

FREIGHT car trucks have only two primary functions to perform, namely, (1) support the load safely on the rails under all ordinary conditions of operation, and (2) cushion the vertical shocks in service so that both the lading and the car structure will be protected from damage. The design of freight-car trucks to meet the full requirements of modern high-speed operation is, in its present state, far from an exact science and the only thing which may safely be said about it is that both railroads and equipment manufacturers are now giving the subject more intensive and intelligent study than at any previous time.

For many years, the conventional four-wheel truck with cast-steel side frames and coil-spring-supported bolster, built in accordance with Association of American Railroads standards for interchange freight service, functioned very creditably, because speeds were low and seldom reached the lowest critical of about 35 m. p. h. at which vertical oscillation tends to build up and produce heavy shocks. When, in response to public demand about 10 years ago, freight-train speeds were increased to 45 m. p. h. and in some instances to 65 m. p. h., or more, difficulties from excessive bouncing became serious; springs broke; car maintenance costs and lading damage increased. In fact, it became apparent that something must be done to enable the conventional truck to cushion shocks more adequately in the higher speed ranges.

Making Old Trucks Ride Better

The truck-spring snubber is greatly improving the riding qualities of standard freight-car trucks. It is reducing damage to lading and protecting car structures against the effects of violent vertical oscillations. It fulfills an important function in adapting conventional freight-car trucks to higher speed operation.

The Function of Spring Snubbers

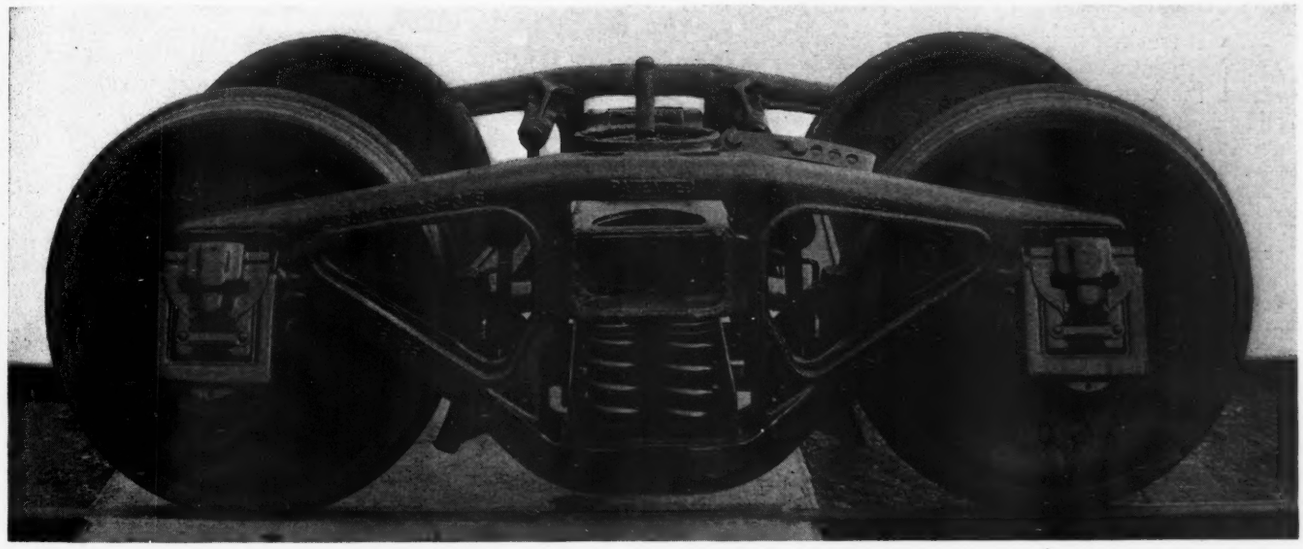
The first answer to this problem was the development of various types of spring snubbing devices, equivalent to shock absorbers in automotive practice, which could be inserted easily in place of one or more of the coil springs in bolster spring groups, thus definitely preventing periodic vertical oscillation of the bolster at critical speeds and, in effect, giving a new lease of life to the conventional cast-steel truck for high-speed service. Great ingenuity and engineering experience were built into many of these devices, developed largely by railway supply manufacturers, which included such elements in

New Trucks for High Speeds

Several new car-trucks designed to produce greatly improved riding characteristics for the new high-speed merchandise train service have been subjected to elaborate tests by the A. A. R. Data from these tests will form a point of departure for further developments tending to narrow the gap between the riding qualities of the freight-train car and those of the passenger-train car.

may be divided into several general classifications. These are: (1) steel-spring friction type—Cardwell Type A, Miner Class C-2-XB, National Type F-2-A, Holland Style A, Frost No. 360 and the recently-developed Gustin-Bacon Type A-1; (2) rubber-spring friction type—A. S. F. Simplex Type B and Unit type and the Symington Type SBR; (3) Symington coil-elliptic spring group, and (4) the Barber bolster stabilizer which utilizes spring-supported taper blocks in the side-frame columns to develop friction directly against the bolster sides. This bolster stabilizer, made by the Standard Car Truck Company, and another design which supplies its dampening effect on the up-stroke and is made by the Railway Truck Corporation, are the only two snubbing devices mentioned above which require any change whatever in truck design. Only approximately 350,000 car sets of these various types of snubbers are now in service, constituting less than 18 per cent of the combined railway and private line freight-car ownership.

Left:—Method of Inserting Snubber (Simplex Unit Type) in a Four-Coil Bolster-Spring Group—Below: The Conventional Freight-Car Truck, without Snubbers or Stabilizer, Gives a Good Ride Only at Low Speeds and Relatively Heavy Loads

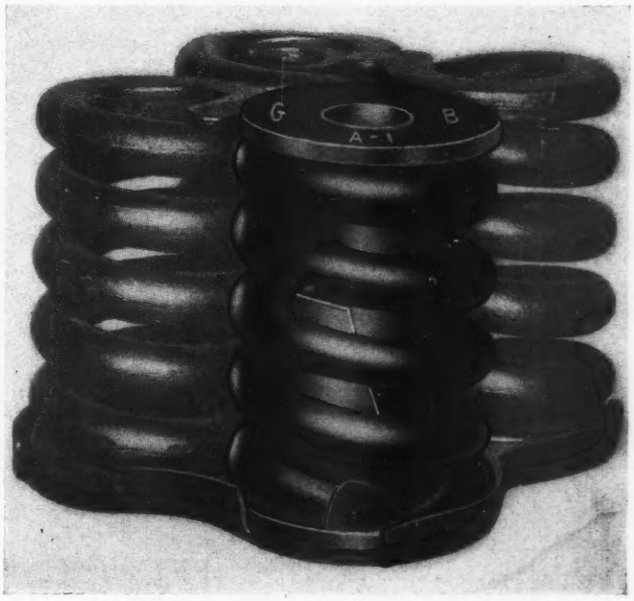


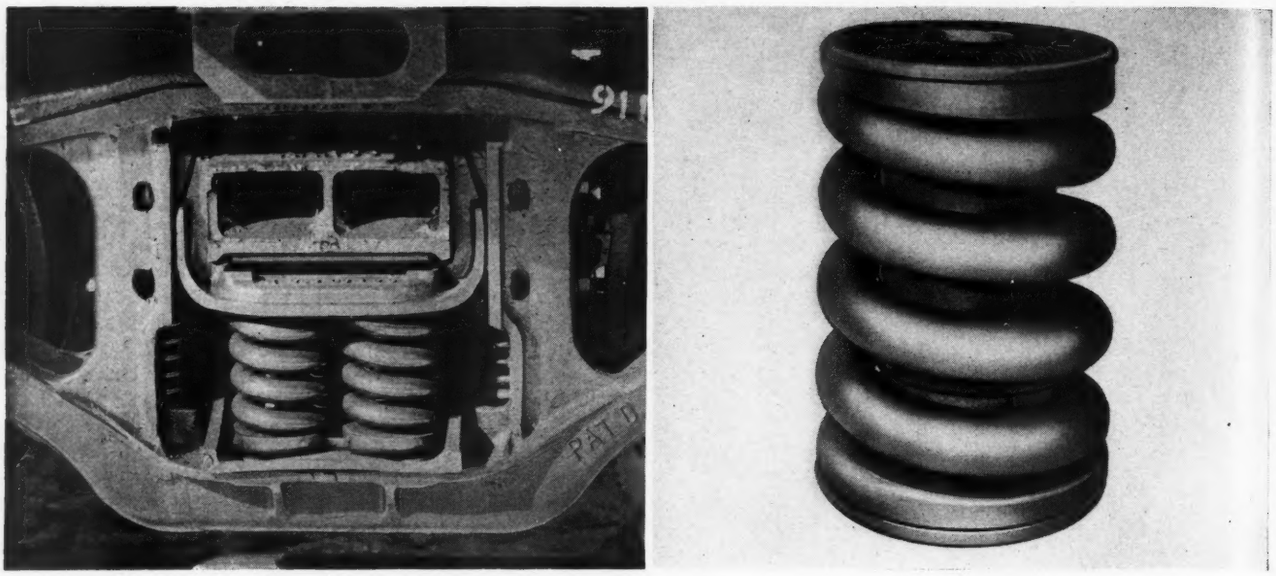
Right: The Gustin-Bacon Type A-1 Snubber Unit in Place in Bolster a Spring Group

their construction as friction blocks and springs, coil and elliptic spring combinations, volute springs, rubber springs, etc. In addition to replacement spring snubbers, two designs were brought out which involved slight changes in the side frames, or bolster, and the third step was the design of several entirely new trucks intended to give superior riding characteristics at high speeds.

Recognizing the importance of this development, the Assocation of American Railroads arranged for extensive road tests of 12 different types of spring snubbers and trucks in 1933 and, while almost none of these devices came through with an absolutely clear record, as indicated by the final report made in December, 1937, it is a fact that the tests were well worth while and served a most constructive purpose, since they developed information subsequently used in conjunction with manufacturers' laboratory tests, to effect progressive improvements in all of the designs which were fundamentally sound in principle.

The truck-spring snubbing devices now more or less widely used or being considered for railway service





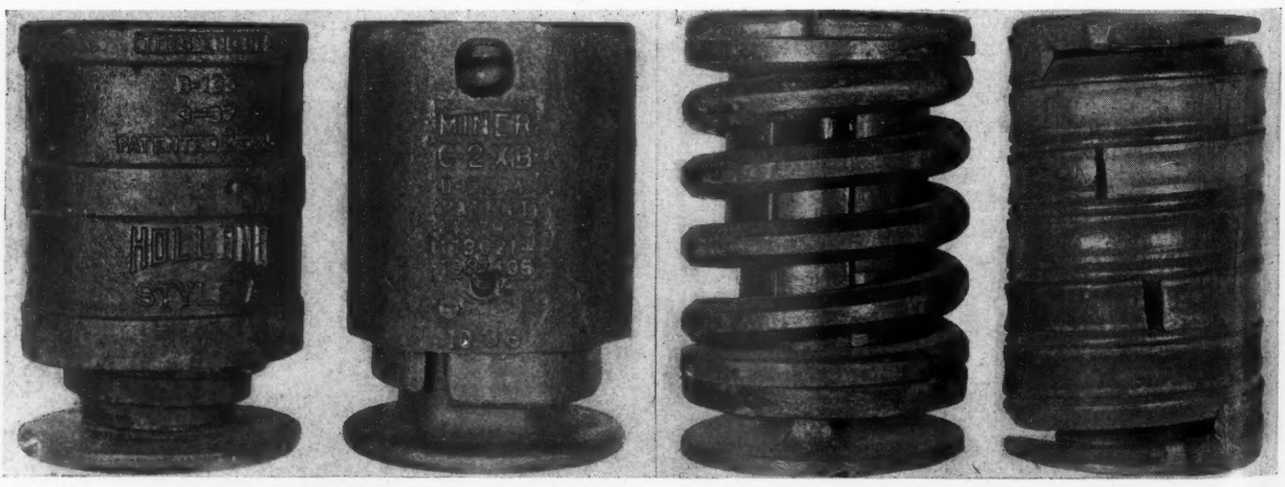
Left: Barber Bolster Stabilizer as Applied with Slight Modifications in Standard Side Frame—Right: The Symington Type SBR Snubber Unit

While truck-spring snubbers are still being studied and improved, enough experience has been accumulated within the past 10 years to prove what can be accomplished by the use of snubbers of correct design in reducing damage to lading and attendant claim payments, and in curtailing many items of car maintenance expense, thus justifying their application on coal cars, tank cars and other bulk commodity cars, as well as refrigerators and box cars carrying food products and more or less fragile commodities. These devices, therefore, are of definite value both to shippers, railroads and private car companies. They fulfill an important function in adapting the A. A. R. conventional freight-car truck to high-speed operation and, hence, the indications are that they will play no inconsiderable part in railway operation for many years to come, in fact, until the present truck now used on practically all freight cars is superseded by an improved design.

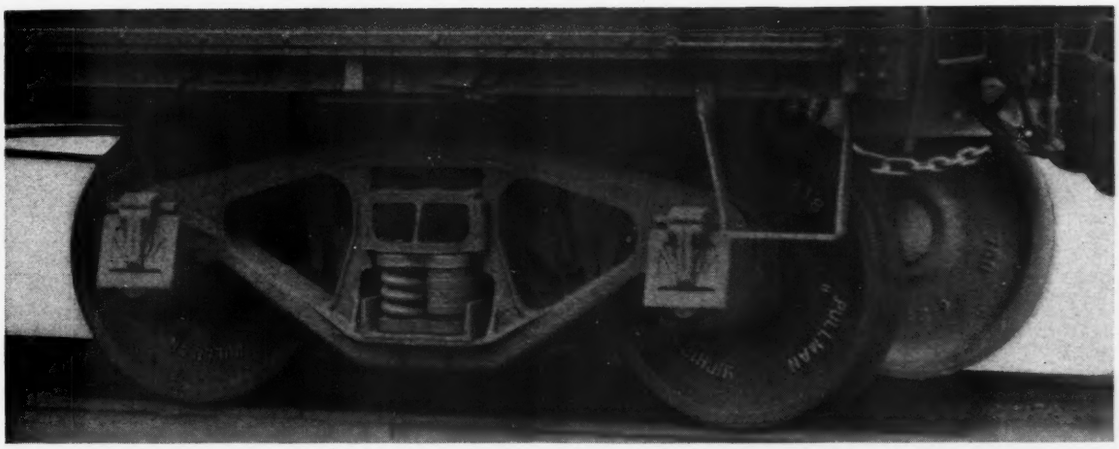
Especially within the past two or three years, freight-train speeds have been stepped up again, creating a demand for freight-car trucks capable of safe and satisfactory operation at speeds ranging as high as 85 or 90 m. p. h. In meeting this challenge, the railroads and the equipment manufacturers have already developed several new car-truck designs with greatly improved riding characteristics and some experienced railway officers believe that even more important improvements may be expected in the future.

Great stimulus was given to current interest in freight-car truck design and performance when J. J. Pelley, president of the Association of American Railroads, announced in April, 1939, that the association had appropriated $45,000 for a research project involving "a series of tests to determine what improvements can be made in the construction of railroad freight-car trucks in order to better fit them to meet operating conditions resulting from substantially increased speeds in modern freight service."

Mr. Pelley said that the proposed tests would be the most comprehensive of their kind ever conducted by the railroads and out of them it was expected that a freight-car truck would be developed which could be used on freight trains moving at speeds as great as the fastest passenger trains now being operated in the United States. Mr. Pelley announced the following general purposes of the truck tests: (1) Still greater improve-



Typical Snubbers Designed To Replace Standard Coil Springs in Bolster Spring Groups—Left to Right: Holland Style A; Miner Class C-2-XB; Cardwell Type A; Frost No. 360



Snubbers Under the Ends of the Bolsters Dampen Vertical Oscillations at Critical Speeds

ment in safety on the railroads; (2) a continued improvement in service to the public by expediting still further the movement of freight; (3) reduced maintenance, both to equipment and roadbed; and (4) increased efficiency in operation."

Initial road tests were begun June 16 on the Pennsylvania, between Altoona and Lock Haven, Pa. The test train consisted of a Pennsylvania E-6 Atlantic-type steam locomotive with 80-in. driving wheels, and five cars, including two baggage cars and one coach, Nos. 1, 3 and 5, and two test cars Nos. 2 and 4 in the train. The test cars and instruments were leased from the Symington-Gould Corporation and additional test instruments were furnished by the A. A. R. and the Pennsylvania. The No. 3 baggage car served as an office car for the accommodation of the test crews. The program of tests, conducted under the general direction of W. I. Cantley, mechanical engineer of the A. A. R. Mechanical Division, was outlined at a joint meeting of various truck manufacturers and railroad representatives, the following companies agreeing to furnish trucks for test purposes: Pennsylvania, Symington-Gould Corporation, National Malleable & Steel Castings Company, American Steel Foundries, Scullin Steel Company, Ohio Steel Foundry Company, Buckeye Steel Castings Company, The Bettendorf Company, Standard Car Truck Company, Allied Railway Equipment Company and the Railway Truck Corporation.

The comprehensive and extensive program of tests, which was arranged, included road tests of each of these types of trucks under varying speed and load conditions, and with car wheels ground circular and eccentric, the test procedure being worked out in great detail so as to develop accurate comparative data on an impartial basis with minimum delay and cost in changing trucks, varying car loads, etc. These tests were completed in November, 1939; the voluminous test data are now being analyzed, and the results will, no doubt, be released in the near future and point the way to further important improvements in truck design.

Until this A. A. R. truck test report is available, any detailed description of the trucks involved, or their performance under service test conditions, might well prove both premature and misleading. One thing seems certain from developments to date, however, and that is that the progressive and co-operative attitude of the Association of American Railroads, individual railroads and the equipment manufacturers in attacking this problem will develop at least the fundamental characteristics and structural requirements of improved high-speed freight-car trucks, the general use of which will benefit greatly both rail carriers and shippers.

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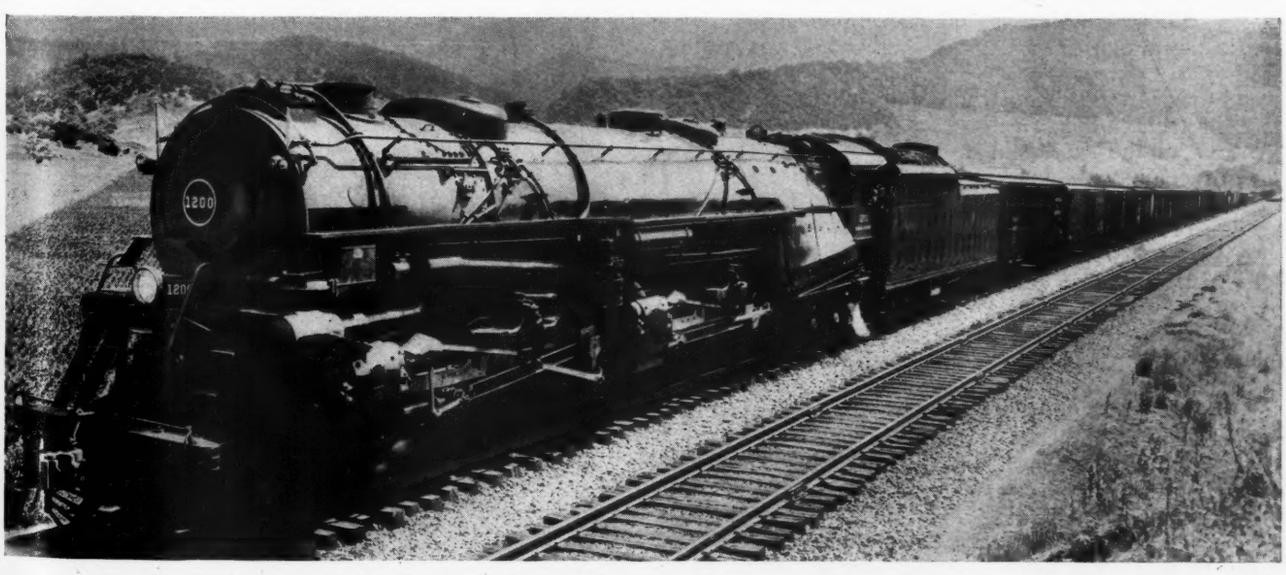


High-Capacity Freight Power on the Norfolk & Western

Freight Car Specialties for Speed

On the Milwaukee

A discussion of devices other than trucks in relation to safe and fast rail freight movement

NEXT to trucks, which are covered in another article in this issue, the most important single factor in freight car construction for the safe and fast transportation of commodities by rail is the combination of uniformly reliable structural materials, built into freight cars of sound basic design. Too much credit cannot be given to the steel manufacturers, for example, in developing steels with special durability and corrosion-resisting properties and, at the same time, having physical characteristics adapted to the particular requirements in various parts of the car structures. The same statement applies, and with equal force, to the manufacturers of steel castings, who supply such fundamental parts as couplers, draft gears, draft castings, bolster center castings, hopper door frames and, in some instances, entire freight car underframes cast as single units.

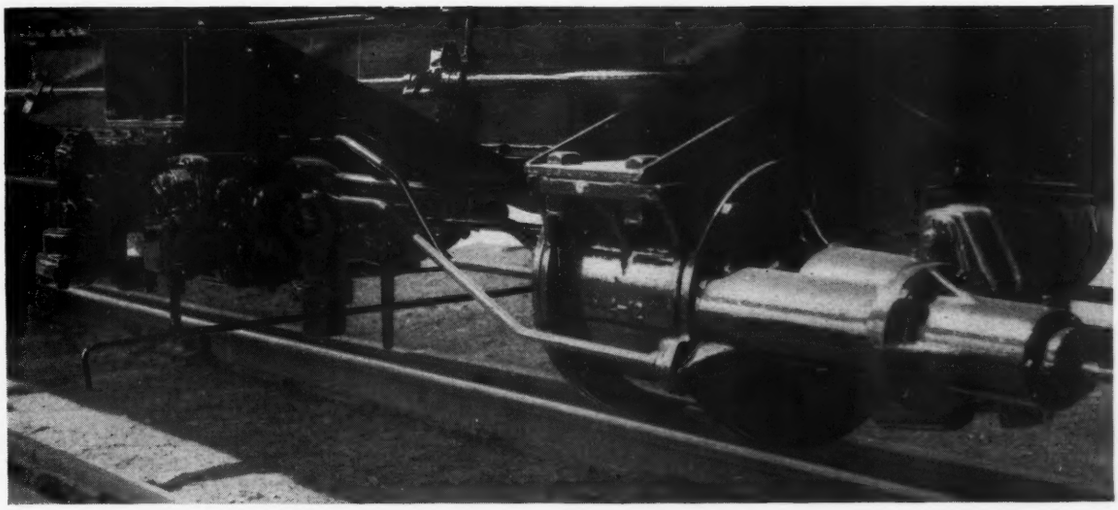
Carbon steels have been successfully alloyed to give increased physical properties with reduced weight in steel castings, as well as rolled steel, thus further assisting in the design of cars with a higher ratio of revenue load to tare weight. In spite of the comparatively recent trend toward welded construction for fabricated car parts and, in fact, complete car bodies, it is no exaggeration to say that the successful operation of present railway freight equipment, and the excellent service generally given to shippers, is dependent in no small measure on the uniform strength and reliability of steel castings that are used at so many vital points in freight car construction.

How Train-Handling Shocks Are Cushioned

Second only to suitable trucks and a sound car structure, in relation to the safe transportation of freight commodities at higher speeds are the draft gears used to cushion longitudinal shocks in starting and stopping individual cars and trains; also in reducing shocks due to slack action when braking, or when operating in hilly country. **Considering the limited space in which they have to work, modern "certified" friction draft gears are highly efficient machines, but give full protection against service shocks only up to a speed of about 4 m. p. h., for example, for 70-ton cars, fully loaded, and 6 m. p. h. for 50-ton cars, partially loaded.** At impacts above these speeds, the draft gears close, or become solid, and cars and lading are subject to damage, roughly in proportion to the square of the speed. The time saved by the use of excessive switching speeds, therefore, is a poor service to railroads and shippers alike.

Freight car draft gears are made in many different designs, utilizing combinations of spring plates, cast blocks and springs, with a minimum overall length of 24⅝ in., and travel limits between 2½ in. and 2¾ in. To meet the specifications of the Association of Amer-

Loading Packed Oranges on the Santa Fe—The "Refer" Is Equipped with Power-Driven Air-Circulating Fans



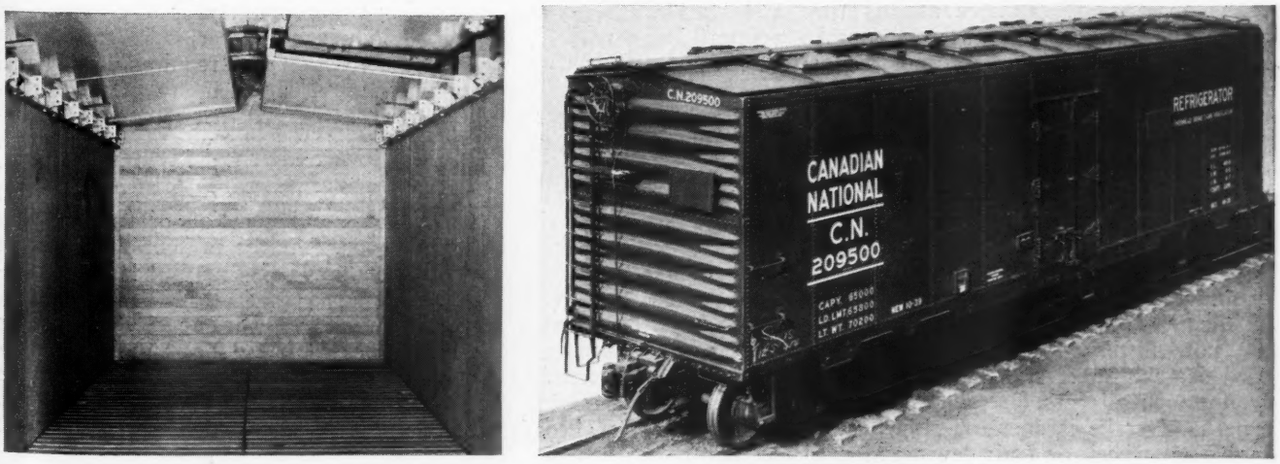
Type-AB Air Brake Equipment on a Tank Car

ican Railroads for approved draft gears, each make and type of gear must develop 18,000 ft. lb. in a prescribed capacity test; withstand an endurance test of 25,000,000 ft. lb., without evidence of distress or a reduction in capacity below 15,000 ft. lb.; and also pass a sturdiness test of over-solid blows without serious damage or reducing the capacity to less than 13,500 ft. lb.

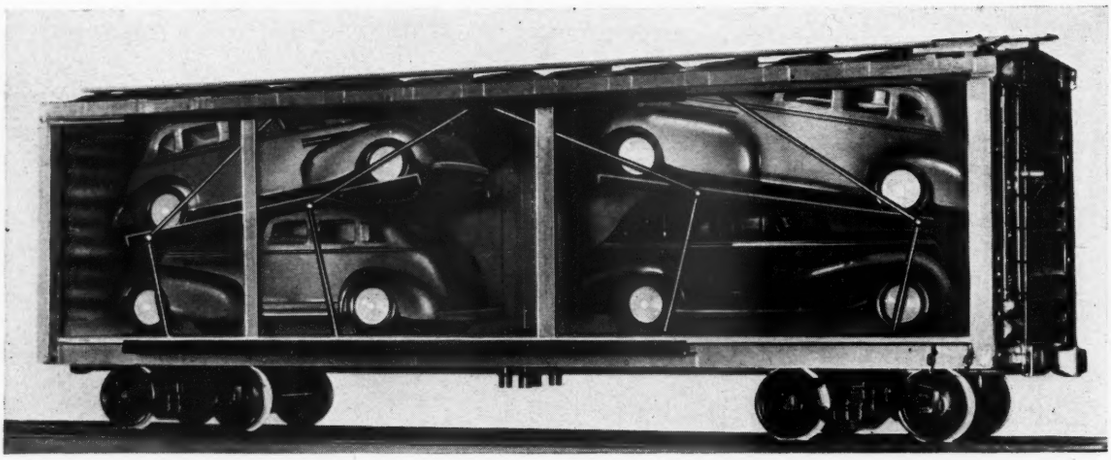
These are minimum requirements, exceeded to a considerable extent by 11 A. A. R. approved, or "certified," friction draft gears now supplied by the following six manufacturers: Cardwell Westinghouse Company, Edgewater Steel Company, W. H. Miner, Inc., National Malleable & Steel Castings Company, Peerless Equipment Company, and the Waugh Equipment Company. Older and less efficient types of draft gears, included in the A. A. R. list of non-approved gears, are being replaced by certified gears as fast as practicable in the interest of more adequate protection of cars and lading from the shocks incident to train handling. This added protection is particularly needed with the increase in train speeds required to meet the demands of modern freight service.

In addition to the conventional certified draft gears, selective travel gears have been developed and used successfully in freight cars of large capacity which operate in more or less specialized, heavy-duty service on individual railroads and are not ordinarily offered in interchange with another carrier. Some of these gears, with 4 in. of travel in buff and 2½ in. in draft, are said to have twice the capacity of conventional gears and yet maintain low sill pressures. The limiting factor is the greater draft lug spacing required with the selective travel gears which makes their general use largely impracticable on present freight equipment for both mechanical and economic reasons. Most railroad men believe that if several million dollars were available for the improvement of draft gear conditions, more net good could be accomplished by replacing all of the existing "non-approved" gears than by installing the much smaller number of long-travel gears which could be placed in service for the same money, owing to the extra cost of draft pocket alterations and the fact that on some cars, space would simply not be available to insert the longer gears.

Still another development designed to effect important improvements in railway operation, as relates to the protection of freight cars and lading from both normal and excessive service shocks, is the Duryea cushioned underframe which has been applied to about 31,000 cars in the past 10 years or more. In this construction, the structural steel center sill is divorced from its normal load-carrying function and has 7 in. of spring-controlled travel through the underframe which, in conjunction with 1 in. of coupler spring-gear travel at



The Cooled Air is Directed to the Side-Wall Air Ducts and Returns Through the Center Duct between the Overhead Ice Bunkers



Four Automobiles Loaded in a Car by Means of the Evans Auto-Loader Device

either end of the center sill, gives a total cushioned travel of 8 in. This long travel, with the attendant friction developed between the center sill and the supporting car frame, is said to absorb shocks and impacts, so that switching speeds of 5 to 6 m. p. h. may be used without exceeding the safe limit of reaction forces transmitted to the car body, lading, underframe, or trucks. It is claimed that this type of cushioned underframe greatly reduces serial slack action in trains, with attendant high shocks and resulting damage to lading and equipment.

How the "AB" Brake Helps Railroads and Shippers

Smoother and safer handling of both long and short freight trains on faster schedules were the objectives sought in developing the improved Type-AB air brake equipment which is supplied by either the Westinghouse Air Brake Company or the New York Air Brake Company and has been applied to date to approximately 16 per cent of the present freight car ownership. Relatively few railroad men and probably no shippers understand the detailed operation of this new equipment but all are favorably affected by its results in smoother and more satisfactory brake operation at all speeds.

Principal features of the Type-AB freight brake include improved quick service in three stages to assure prompt and positive brake applications on all cars of long modern trains; improved release feature which automatically reduces auxiliary pressure and prevents any possibility of "stuck" brakes; improved emergency brake applications available at any time and without danger of "undesired" emergency brake applications; improvements in other important details.

In addition, a Type-AB empty-and-load brake equipment has been developed which automatically changes over from one brake-cylinder operation with a light car to two-cylinder operation with a fully-loaded car. This type of brake has been applied so far largely to gondolas and hopper cars which carry coal or ore in one direction only and return empty.

The safety of freight train operation and the handling of individual cars is also promoted to no inconsiderable extent by greatly-improved gear-type hand brakes which are now furnished by specialty manufacturers in accordance with A. A. R. specifications and have been required on all cars built new since 1937. The gear-type hand brake is operated either by a vertical wheel, horizontal wheel, or hand lever and works in harmony with the power brake, being designed so that the effective force exerted at the air brake piston connection is not less than that exerted by the air brake cylinder at 50 lb. pressure. The leverage ratio is selected to give a braking force not less than 20 per cent of the total weight of the car.

Numerous important safety features are written into the A. A. R. specifications for gear-type hand brakes, being designed to assure the safety of trainmen under all normal conditions of applying and releasing the brakes. In this connection, the safety of trainmen is further promoted by means of improved metal running boards and brake steps which consist of rolled steel plates with special non-skid surfaces, or are made of narrow steel strips placed vertically a fixed distance apart and having the longitudinal and cross spacing members joined mechanically or by electric pressure welding. The particular advantages of modern metal running boards are strength, long prospective life and anti-slip properties, in conjunction with the fact that they are largely self-clearing as regards the accumulation of snow and ice.

Tight Roofs and Doors Essential

Considering the substantial proportion of freight claims due to damage to lading caused by the leakage of water and dust through freight car roofs, the importance of making this construction leak-proof is apparent, in the interests of both shippers and the railroads alike. All-steel car roofs, developed especially to meet this need, are made of galvanized steel sections, riveted, welded, or held in place by patented clamp designs and embodying two general types of construction, namely, (1) rigid, in which the car is assumed to be basically rigid in construction and requires a rigid roof to tie the various side and end members of the car together; and (2) flexible, in which it is considered impracticable to eliminate car body weave entirely and, hence, a more or less flexible roof construction is required to avoid splitting or tearing of the relatively thin roof sheets under the weaving action of the car, thus causing leaks to develop. At the present time, flexible roof sheets, or sections, are being applied largely as replacements for repair purposes.

One thing appears clear. **The service conditions under which freight car roofs must operate are exceptionally severe, and present improved metal roofs are meeting these conditions with general satisfaction.** Railroads are giving increased attention to securing tight roofs on older, as well as on modern cars, thus minimizing lading damage due to water and cinder leakage. Tight doors and effective door-operating fixtures are also essen-

A Covered Hopper Car Built by Pullman-Standard

tial to this objective and, in addition, have the important duty of preventing the loss of fine bulk commodities through leakage.

Water damage in freight cars is by no means confined to that which comes in through leaky roofs or doors, since the loading of commodities such as hot flour and cereals in steel roof cars, when outside temperatures are low, produces condensation or sweating on the underside of the car roof and this water drops on the lading and damages it. The amount of this condensation with an outside temperature of 20 deg. F. is estimated to be as much as 60 gal. of water per car, and extensive tests were conducted by the A. A. R. in 1935 to see what could be done about eliminating this cause of lading damage. The relative merits of wood lining and sawdust impregnated asphalt on all inside metal surfaces, including the roof, were studied in this test and the conclusion of the committee was that "no form of interior treatment of the steel box car within economic practicability will wholly prevent condensation from affecting 'hot' loads unless precooled to 50 deg. F. or less."

While precooling was shown to be the answer to the most difficult condensation problem, the railroads generally have gone as far as they can in protecting shippers against damage from this cause by spraying the inside roof sheets of many thousands of first-class box and automobile cars with various insulating materials, or applying wood lining, or both. For wood roof lining and, in some cases, for the entire inside lining, plywood has recently been used quite extensively. This material, when made to the correct specifications, is a uniformly strong and homogenous product, quickly and easily applied with relatively few joints and has the important advantage of being available in varied thicknesses and numbers of ply to meet exact structural requirements. In fact, it is, strictly speaking, and in its best form, a carefully-engineered material, and a considerable number of cars, particularly refrigerator cars, are now in service with the entire car bodies, exclusive of the steel frame, made of plywood.

Refrigerator Car Insulation and Service

The American standard of living, as reflected by the consumption of perishable food products at home, and an important segment of American export trade, are both made possible to a large extent by railway refrigerator transport service not approached either in volume or quality anywhere else in the world. This service is provided by means of about 23,000 railroad-owned and 124,000 privately owned refrigerator cars which are distributed in accordance with traffic demands and are used to supply cooling, heating or ventilation, as required. In fact, the change from one of these services to another may, under certain conditions, be necessary with a single shipment.

One of the most important things about a refrigerator car is the kind and amount of insulation used in the car structure, and designers have a wide choice of excellent materials which have been developed by different manufacturers through the years and represent in the aggregate a vast amount of painstaking research, test and improvement in product. Insulation, ordinarily used in refrigerator cars, may be grouped in the following general types: Felted hair, treated vegetable fibres, treated mineral fibres, and reflective insulating materials, primarily dependent upon aluminum foil to reflect the heat rays. Desirable insulation characteristics include high thermal efficiency, permanence of structure, light weight and as much resistance as possible against moisture, mold, rot, settling and fire. Most refrigerator cars are constructed with at least three or four inches of insulation in the floors, sides, ends and roofs, and a considerable number of super-insulated cars have six inches of insulation all around, plus two reflective surfaces. This assures unusually low ice consumption, fewer re-icings enroute, quicker deliveries and reduced ice charges, all of which is conducive to the movement of more perishable shipments by rail.

Insulation is by no means the only important specialty used in the construction of refrigerator cars, as the manufacturers have exercised their usual ingenuity and long experience in developing such improved parts as insulated doors and door fixtures, hatch plugs and locks, bulkheads, floor rack holders, well traps, brine tank hand holes, drip traps, etc. Additional refinements in design and the increased use of steel construction have also added greatly to the strength and serviceability of refrigerator cars.

It is true that the modern refrigerator car, equipped with end ice-bunkers and iced through hatches in the roof, utilizes the same principle of cooling as the earliest refrigerator cars. The proportions of ice and coarse salt needed to produce desired temperatures are largely a matter of guesswork, based on commodity temperature, car construction and outside temperature; non-uniform circulation of cooled air makes it difficult to avoid rather wide temperature variations throughout the lading; in heater service, portable charcoal heaters located in the ice bunkers cannot give close temperature control and do produce noxious gases.

In defense of conventional ice-type refrigerator cars,

however, it may be said that the limitations mentioned are largely overcome, or neutralized, by the skill and experience of railway men and private car operators. Ice and salt are universally available, cheap and foolproof and the cars give excellent service, as shown by the fact that less than one per cent of freight loss and damage claims in 1939 were due to improper refrigeration and only 1.5 per cent to freezing or heater failure.

With a view to furnishing still better refrigeration service at reduced cost to shippers, attempts are now under way to improve air circulation in refrigerator cars by various means, including the use of small blowers, operated by direct drive from the wheel tread. In one car design, developed on the Canadian National, shallow overhead ice bunkers, located throughout the length of the car, are used to cool air which passes downward through side wall air ducts to the floor where it circulates more or less uniformly under the floor racks and moves gradually upward to permeate the entire load as warm air is drawn out of the refrigeration compartment through a center ceiling duct at the top. This car is equipped with an underslung charcoal heater having draft control and arranged to heat the load as much as required from the bottom by means of heating coils under the floor racks.

Provision is also made for ventilation, so all three types of refrigerator car service are available in improved form in this single car design.

The possibilities of "mechanical refrigeration" for refrigerator cars also have been rather thoroughly explored in the last few years and are apparently not very bright, both for economic and mechanical reasons. The need for such a development was strongly urged in an article "Would Mechanical Refrigeration Hold Traffic?" published in the *Railway Age* of January 27, and the answer was given in some detail by the National Perishable Freight Committee in the *Railway Age* of April 20.

The first point which was raised by the committee, namely that only about one-third of refrigerator carloads require cooling, would seem to preclude any general installation of mechanical refrigeration units for economic reasons. Moreover, top icing will apparently always be required for certain perishable commodities to keep them moist, fresh and firm. From a mechanical standpoint, experience with a number of different types of cooling units during extensive service tests would seem to indicate almost insurmountable difficulties in developing equipment of sufficient reliability under shocks incident to freight train operation without prohibitive expense for supervision.

The question of improved railway refrigeration service by means of partition cars for part loading, and, especially, portable refrigerated containers for handling in equipment other than refrigerator cars is covered elsewhere in this issue.

Automobile and Other Special Loading Devices

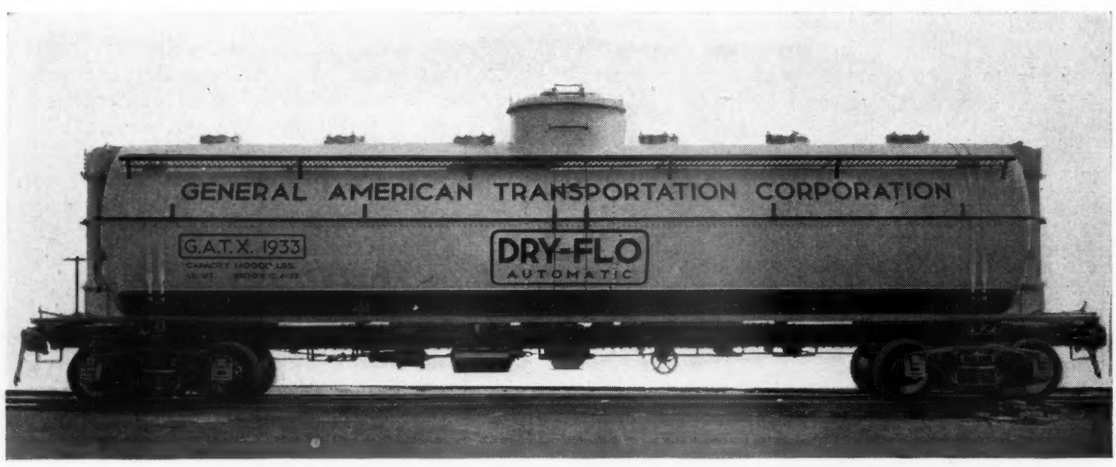
Records compiled by the A. A. R. Car Service Division indicate that on April 1, 1940, the railroads already had in service, or were planning to equip, a total of 32,853 box cars with automobile loading devices. In general, these devices are designed to permit carrying greater loads in individual cars with less chance of damage to the shipments, reduced charges for blocking and the elimination of car damage due to nailing or bolting wooden blocks and hold-down devices to the car floor.

Devices for holding complete automobiles, usually four in number, in box cars are so arranged that the supporting bars, hold-down chains, etc., may be drawn up to the roof or depressed in the floor, thus permitting the cars to be used for other loading. Special service cars are equipped for the exclusive shipment of automobile bodies, frames, engines, or axle assemblies, etc. They furnish an important service for shippers and are excellent revenue earners for railroads in spite of restricted use in transporting highly-specialized commodities.

Another type of improved service has been made available to shippers to an increasing extent in the past few years by means of covered hopper cars, 482 of which were ordered by 12 railroads and private car companies in 1939. These cars, with tight hopper doors at the bottom, and roof hatches also fitted with tight covers and spaced to permit quick and uniform loading, are used for the shipment of many bulk commodities such as grain, cement, Fuller's earth, soda ash, etc., which must be kept dry and clean.

Both loading and unloading time are saved with this type of car; also the cost of containers such as bags, boxes, packages, or barrels, ordinarily used in shipping these commodities. In some instances, car sides and hopper sheets are welded so as to present no interference with the quick and complete discharge of the load. Provision is also sometimes made for the use of electric vibrators to prevent the "arching" of such materials as cement, or wood flour. The time required for loading and unloading covered hopper cars is remarkably low

(*Continued on page 939*)



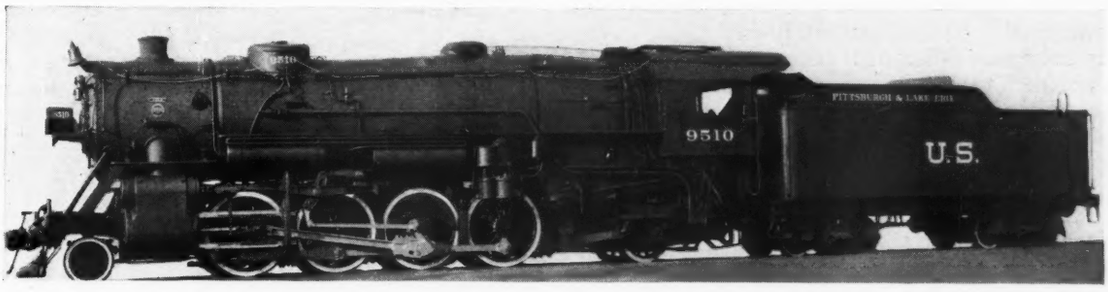
Dry Bulk Commodities are Unloaded Automatically from This Car without Dust

Speed in Freight Service Demands Horsepower

But economy demands that train loads be kept up—Locomotive characteristics for heavy freight and passenger service becoming identical

HIGHER train speeds are as definitely a factor in the future of freight transportation as they have been in the evolution of passenger transportation during the past six years. Indeed, with the exception of 1936, the average speed of freight-train movement has been increasing steadily every year since 1923. From 10.3 miles an hour in 1920, the average reached 16.7 miles an hour last year.

While the higher freight-train speeds of the future are of a different order than the present average speeds, a brief review of the changes in freight-train performance, along with changes in freight locomotive proportions during the past twenty years, will be suggestive as to the character of the motive power needed for the future higher speeds.



A Freight Locomotive of the Late Drag Era

Twenty years ago the era of the drag freight train was drawing to a close. This era was dominated by the facts, so clearly set forth by James J. Hill, that freight-train operating expenses vary with train-miles and freight revenues with ton-miles, so that the fewer train-miles made and the more ton-miles sold the better the financial result.

This era was characterized by slow-moving freight trains loaded to the tractive capacity of the locomotives over the ruling grades. A typical freight locomotive of the period was a 2-8-2 type with driving wheels 60 in. to 63 in. in diameter, a tractive force rating of about 60,000 lb., a combined heating surface of about 5,000 sq. ft., and about 70 sq. ft. of grate area. Boiler pressures ranged from 180 to 200 lb. per sq. in. Nearly 75 per cent of the total weight of the locomotive was on the drivers.

During the middle 1920's the preoccupation of the railroads with keeping ton-miles costs low began to give way to meeting the demands for better service, particularly to regularizing and speeding up deliveries. First came the elimination of terminal delays, then the reduction of delays to trains en route. Steadily the movement of more and more of the main-line tonnage of American railroads is assuming the regularity of passenger-train operation and the road speed of trains loaded with the higher-grade products has been increasing.

This has changed the entire approach to the problem of freight motive power from the tractive-force rating required to move the desired train load over the ruling grade to the horsepower required to move the train over the division within the required schedule time.

By the middle 1920's the 4-8-2 was superseding the 2-8-2 type as new freight locomotives were purchased, and the 2-8-4 type had been launched on its career. With increasing wheel loads some of these locomotives developed 65,000 to 69,000 lb. tractive force. The 4-8-2's were being built with about 6,000 sq. ft. of combined heating surface and between 67 and 70 per cent of the weight of the locomotive was on the drivers. On the 2-8-4 locomotives the combined heating surface exceeded 7,000 sq. ft. and the area of the grates was 100 sq. ft. The weight on the drivers of these locomotives dropped as low as 62 per cent and did not exceed 65 per cent. With few exceptions, however, the diameter of the drivers was 63 in., whereas most of the 4-8-2 freight locomotives of this period had 69-in. driving wheels; in a few instances locomotives intended for both the freight and passenger service were built with larger wheels.

The advent of the 2-8-4 type locomotive marked the beginning of the use of higher boiler pressures and the general installation of the Type E superheater. Boiler pressures on the locomotives built during the latter half of the 1920's and since have ranged from 240 to around 275 lb.

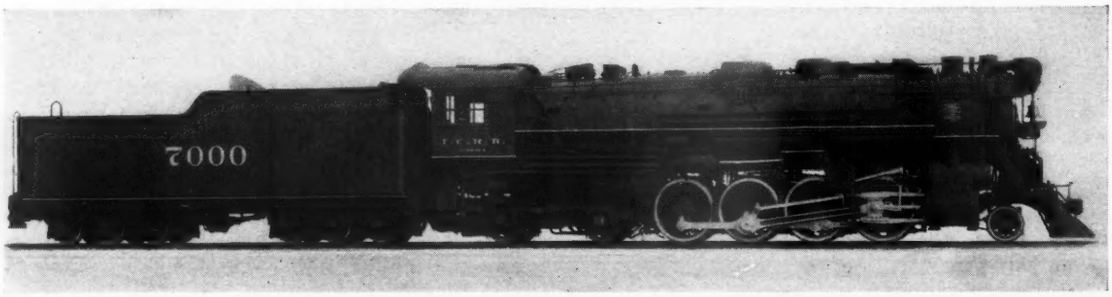
At present the demand is for merchandise freight trains to operate over long distances at 40 to 45 mile-an-hour schedules, requiring road speeds as high as 60 to 70 miles an hour. For such trains the eight-coupled locomotive has evolved into the 4-8-4 type. Numerous such locomotives have been built for freight service during the past five years with 73-in. to 77-in. drivers with from 7,500 to 7,900 sq. ft. of combined heating surface, 88- to 115-sq. ft. grates, and tractive-force ratings ranging from 62,000 lb. to 72,000 lb. The weight

on drivers runs slightly less than 60 per cent on most of them.

The high-speed merchandise trains which have already been installed on many railroads provide a scheduled service and the train loading is determined primarily by the demands of the service rather than by the requirements of economical operation. Hence, some of these services, at least, can be operated with existing passenger locomotives. The undoubted tendency of all freight-train service, however, is toward generally higher speeds, miles an hour in 1939. Indeed, where passenger trains are heavy, there is really nothing to distinguish the proportions of a locomotive built for freight service from one built for heavy passenger service.

The Diesel-Electric as a Freight Locomotive

For the past five months the Electro-Motive Corporation has had in operation a Diesel-electric locomotive proportioned for freight service. This locomotive has



A High-Capacity Development of the Middle 20's

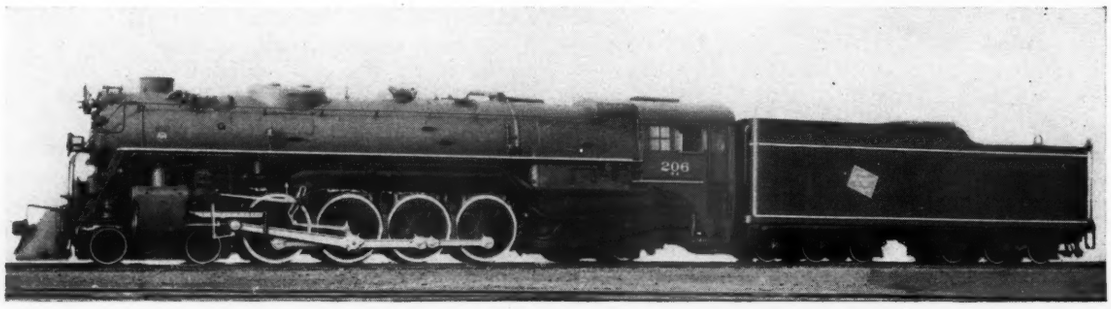
especially on main lines where all classes of traffic use the rails. For one reason, as passenger-train speeds move upward, the interference with freight trains increases as the speed differential between the two classes of trains becomes wider. Considerations of track capacity and economy of freight-train movement, therefore, are both tending in the direction of a general speeding up of freight-train movement.

But it is as true today as it was in the drag-rating era that the freight-train mile is the expense-producing unit and the ton-mile the revenue-producing unit; hence, the increase in average freight-train speed during the past twenty years has been accomplished by no tendency to reduce the average freight-train load. In 1920, when the average freight train moved at an over-the-division rate of 10.3 miles an hour the average gross train load was 1,443 tons. Last year, when freight trains moved at an average speed of 16.7 miles an hour, the average gross train load was over 1,900 tons. The freight locomotive of the future must, therefore, possess the boiler capacity necessary to develop high horsepower outputs at relatively high speeds with the tractive capacity necessary to move car-limit trains over ruling grades.

This is essentially the type of steam freight locomotive being built today. With these locomotives and their heavy trains the average time performance of tonnage movement has been increased from 14,877 gross ton-miles an hour in 1920 to nearly 33,000 gross ton-

been in service with a dynamometer car on several railroads. Data from its performance will go far to indicate the place it may be expected to assume as a freight motive-power unit during the coming era of generally higher freight-train speeds. Some rough idea of what may be expected of such a locomotive, however, may be had by a study of its characteristics.

The locomotive which has been tested is made up of two two-unit locomotives, each unit of which is carried on two four-wheel trucks and driven by a 1,350-hp. General Motors Diesel-electric power plant. The two locomotives, coupled back to back, make a multiple-unit locomotive of 5,400 engine horsepower which weighs about 912,000 lb. and is 193 ft. long over the coupler pulling faces. With all weight on the driving wheels, the starting tractive force is 228,000 lb. The maximum speed at which this locomotive is designed to operate is 75 miles an hour.



A Present-Day High-Capacity, High-Speed Freight Locomotive

In switching service the Diesel-electric locomotive and the steam locomotive which may be considered comparable are of quite different rated horsepower capacity.

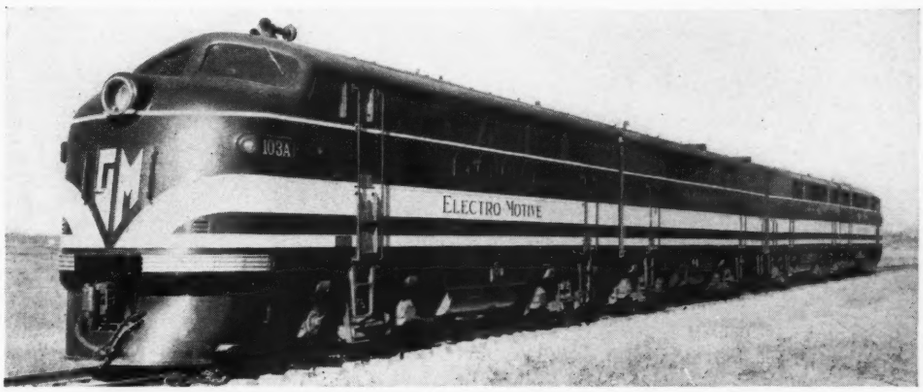
The Diesel-electric locomotive, being essentially a constant horsepower machine, develops a high ratio of starting tractive force to horsepower capacity, dependent on the traction limit, whereas the steam locomotive, which develops its full horsepower rating at relatively high speeds, has a relatively low ratio of tractive force to rated horsepower capacity. Hence, the steam switching

locomotive, compared on a horsepower basis, must be a much higher capacity machine than the Diesel-electric locomotive for the same service. In road service, however, either freight or passenger, where high enough speeds are required to permit the steam locomotive to develop its maximum horsepower capacity, the two types of locomotives for the same service must develop about the same drawbar horsepower.

To compare with the Electro-Motive freight locomotive, a steam freight locomotive could be assumed as a 4-8-4 type with about 7,500 sq. ft. of combined heating surface which would develop a maximum of 4,800 i.hp. and a probable 4,000 to 4,100 drawbar hp. at 45 to 50 miles an hour. Such a locomotive would have a starting tractive force of about 70,000 lb. which would be increased to about 83,000 lb. by the addition of a booster. Its total weight would be in the neighborhood of 450,000 lb. and the weight of engine and tender combined would be between 800,000 and 900,000 lb. The Diesel-electric locomotive will develop about 4,300 to 4,400 drawbar horsepower at low speeds, the curve declining gradually with the increasing locomotive resistance to about 4,000 hp. at 50 miles an hour and dropping off at a somewhat accelerated rate at higher speeds.

From an operating standpoint, the outstanding difference in these two locomotives is the extremely high ratio of starting tractive force to maximum drawbar horsepower of the Diesel-electric locomotive (about 52.8). For the steam locomotive, this ratio is 17 and can be increased to about 20 by the addition of the booster. If the freight train under consideration requires operation at speeds of between 40 and 60 miles an hour, the capacity of the Diesel-electric locomotive to start such a train under conditions in which the steam locomotive would require assistance is evident. Furthermore, at all speeds up to 40 or 45 miles an hour the Diesel-electric locomotive would have a decided advantage in acceleration, but would probably not be able to move the train at a much higher speed than would the steam locomotive.

Where operating conditions call for running speeds below, say, 40 miles an hour, the Diesel-electric locomotive could probably handle a somewhat heavier train load than the steam locomotive and still maintain some of its advantage of higher low-speed acceleration. On long, heavy grades, however, the temperature rise of the electrical equipment would become the controlling factor in determining the train load. The reduction in tonnage from that which the locomotive could drag over the grade would vary with the time required to negotiate it. This is a factor which does not ordinarily have to be taken into account in switching service because of the intermittent character of the demands for heavy traction.



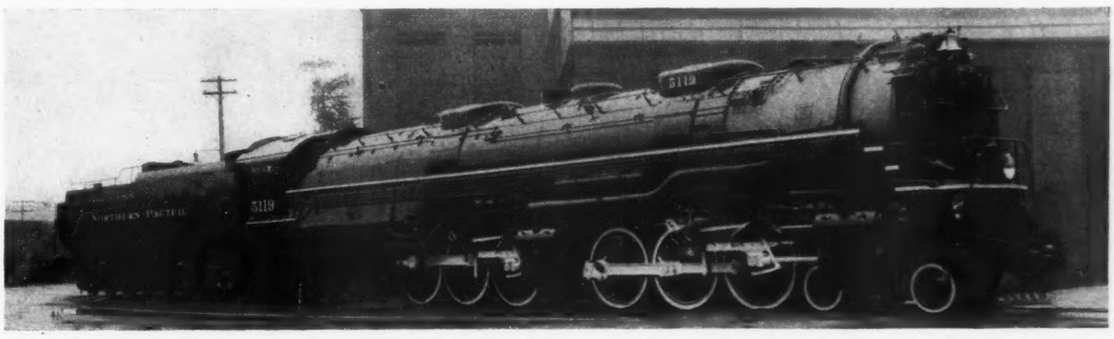
This Diesel-Electric Freight Locomotive Combines High Horsepower with Great Starting Tractive Force

The Diesel-electric locomotive could probably operate at full capacity continuously at speeds down to about 20 miles an hour, at which speed it would develop a drawbar pull of about 80,000 lb.

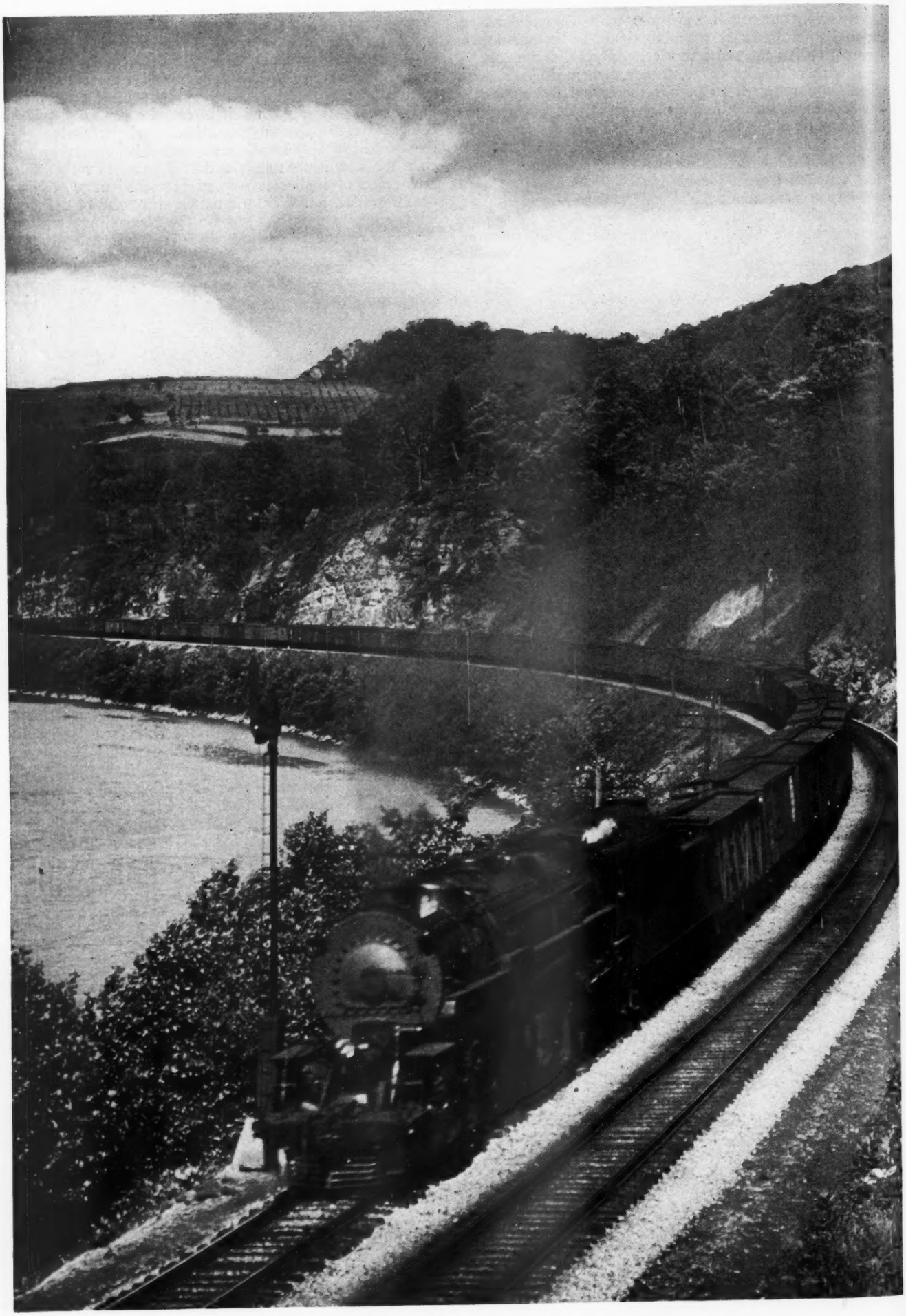
The steam locomotive selected for operation on long, heavy grades would not be a 4-8-4 type, but rather an articulated type with somewhat the same boiler capacity but developing a tractive force of between 90,000 and 100,000 lb. The weight of the locomotive and tender would be about the same as that of the Diesel-electric. It and the Diesel-electric would compare favorably in operation under such conditions.

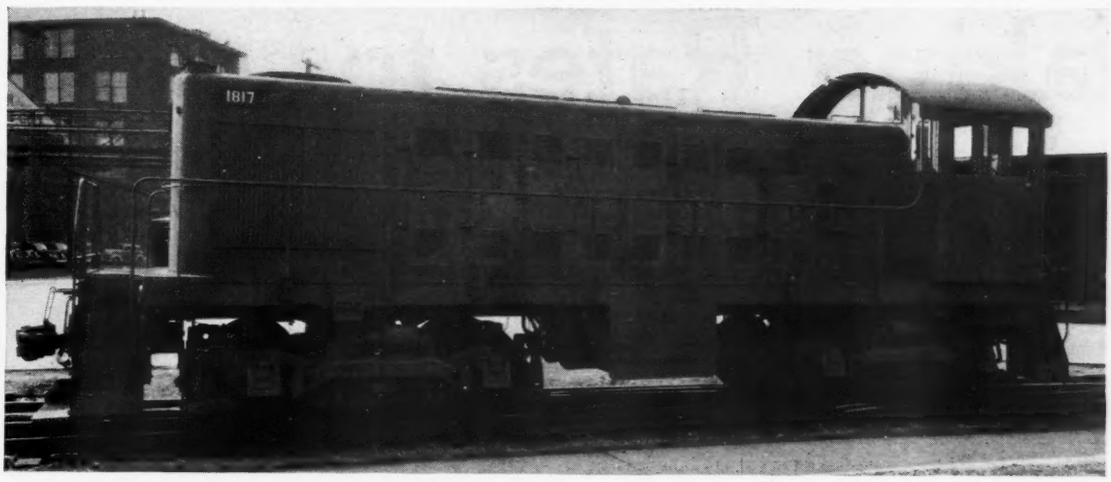
Switching Service

A Diesel-electric locomotive built as a demonstrator by the Ingersoll-Rand and General Electric companies



A High-Capacity Freight Locomotive for Service where Grades are Long and Heavy





A 1,000-Hp. Diesel Electric Switching Locomotive—Built by Alco

was tried out in switching service on the New York City West Side Lines of the New York Central and on other railroads in 1924. A year later the first Diesel-electric switching locomotive to be purchased by a steam railroad was built by the Ingersoll-Rand, the General Electric and the American Locomotive companies for the Central of New Jersey. Since that time the freedom from stand-by losses, the simplicity of servicing because of the freedom from fire cleaning, the high availability and the relatively low expense of operating these locomotives have gained wide acceptance for them as the motive power best suited for switching service. Because of the ability to utilize the full horsepower of the prime mover through the greater part of the speed range within which the locomotive operates, the nominal capacity of a Diesel-switching locomotive need not be nearly as high as that of a steam switching locomotive because the horsepower capacity of the latter is not reached within the range of switching speeds.

Much as six-wheel and eight-wheel steam switching locomotives became the generally accepted standard types, so in the case of the Diesel-electric switchers have the 600-hp. and the 900- or 1,000-hp. capacities been accepted as covering the general requirements of steam railway service. These locomotives have the advantage, however, that they can be combined into larger multiple units when unusual conditions require more power than can be furnished by a single unit.

Up to the present time over 600 Diesel switching locomotives have been built. For the month of December, 1939, 7.4 per cent of the combined freight and passenger yard switching locomotive hours were produced by locomotives of this type. At the end of that month, out of a total of 12,771 of all types of locomotives assigned to yard switching service, 488 were internal combustion locomotives—3.8 per cent of the total. The average daily service of these engines during the month was 18.6 hours, whereas the average daily service of steam locomotives was about nine hours.

At the end of 1939 there were 7,624 steam locomotives designed for switching service in the inventories of Class I railroads—nearly 1,100 fewer than there were five years earlier. If the trend during the past five years is any criterion of that during the next five years, there will be some acceleration in the rate of increase in the number of Diesel-electric switching locomotives purchased and a correspondingly increasing rate of retirement of steam switching locomotives.

Where service requirements are so light that the capacity of the 600-hp. Diesel-electric switching locomotive is more than is needed, some interest has been shown in the use of smaller locomotives of the industrial class for branch-line switching and even local freight-train operation. Some of these locomotives have been propelled by gasoline engines. Hydraulic transmission of the torque-converter type has also been tried on locomotives in this category.

Such motive power undoubtedly will continue to find limited application where it can save money for the railroads. With the growing evidence of the practicability of the Diesel engine in medium- and small-size units, however, the gasoline engine is not likely to play an important part in the expansion of such services. The hydraulic transmission has not yet advanced beyond the demonstration stage of its development. Until more is known as to the efficiency characteristics of this type of drive throughout its entire operating range, it is difficult to foresee whether it will find its best prospect for usefulness in switching or in road service.

The Industrial Capacity Is Finding Limited Application on the Railroads — A 360-HP. Diesel-Electric Built by Davenport-Besler

Making Rates to Move the Freight

Prices of transportation are being rapidly readjusted to meet the competition which the railroads and their patrons are facing. Understanding by public of where its interest lies is needed, because carriers cannot end present confusion unassisted.

THE railroads today are working harder and with more determination than at any time in previous history on the job of adjusting rates to meet the convenience and the rapidly-shifting needs of the shipping community. Not that shifting the gears of the rate structure to meet the requirements of traffic is any novelty to the railroads. Far from it—such adjustments have gone on (and with a constant accumulation of informed experience behind them) ever since railroads began. The attitude of alert railroad men always has been to make rates which will move the goods—because it is only when producers can afford to ship their products in heavy volume and for long distances that the railroads stand a chance to prosper.

1 The rate structure was one of the main instruments by which America achieved the greatest prosperity known to history. Yet few persons seem aware, or to care, that this valuable device may be scuttled.

But present scrutiny of and action upon rates is more vigorous and searching than ever, and changes are more frequent—because the structure of freight rates, upon which the country achieved prosperity unknown previously in the World's history, has with great suddenness been subjected to an onslaught of novel competitive forces. Nobody "planned it that way." The people wanted highways on which to drive their automobiles—and they got them. But the roads built for private automobiles and to "pull the farmer out of the mud" were soon found usable on a wholesale scale, not only by enterprising "for-hire" trucks, but also by producers hauling their own goods. Nobody yet knows exactly what the cost of this commercial by-product of modern highways really is; and whether the users of the highways pay the owners an adequate "rent" is a matter of dispute.

Anyhow, the sudden parachuting of several million trucks down onto the national transportation landscape, without any forethought as to their effect on a rate structure which had proved itself a prosperity-builder, has presented problems to the guardians of that structure which even supermen could not solve overnight.

Also, the business men of some sections of the country ask their Congressmen to get a federal appropriation to dredge out their local river to make it fit for navigation. In making this request these business men have no thought of wrecking the national freight rate structure. Quite the contrary—they very strongly hope that the national rate structure will stay "as is," and that only the shippers in their area will have a federal subsidy to enable them to enjoy a transportation advantage in getting their goods to markets. But when several of the largest producing areas of the country secure an equal "advantage" over the others in thousands of miles of canalized rivers, the real advantage of any one such area over the others disappears. The business men who had an idea, which looked clever at the time, are left to pay taxes for an "improvement" which was going to give them an "edge" on competition, and now their competitors have exactly the same edge—i. e., no edge at all. Meantime, the freight rate structure under which every area of the country used to prosper has been subjected to a new attack.

So business interests—with no thought of undermining a system of freight rates which had enabled this country to become the model of prosperity for the entire World—nevertheless, by their vigor in each pursuing his supposed private advantage, have brought about a situation which is harmful to all business.

A superhighway can be, and is, built and filled with trucks much more quickly than regulatory authorities and shippers and truck operators can work out a system of rates for that highway, which will conform to the national interest in a stabilized and non-revolutionary (i. e., changing but not exploding) freight rate structure. The same is true of a canalized river. But the highway builders and the canal builders *were* turned loose on a blitzkrieg schedule; and now the rate-makers have to put the pieces together again one by one. A bomb does its work quickly, but a rate structure is built like a great city—one brick at a time.

And so the rate-makers are at work—harder than they have ever been before—building a new structure of rates to fit the new scheme of things.

2 Rates bearing their full quota of overhead costs might prevent many commodities from moving. For a high standard of living, a rate structure which will move all classes of goods is required.

To appreciate what the job of the rate-makers is, and how they are tackling it, it is well to bear in mind what the old structure was upon which America's prosperity was built. The general attitude behind this highly-developed and nicely-balanced system of rates was that charges should not only avoid unfair discrimination, but that they also should bear some relationship to the *value,* as well as the *cost* of moving goods. At no time was "charging what the traffic will bear" the primary principle of rate-making. There has always been, since railroads came under regulation, a safeguard against charging *all* the service was worth or could stand—in the provision that rates as a whole should be no higher than necessary to yield the carriers a reasonable return on their property.

Relatively few of the costs of railroad service are definitely assignable to any given movement of goods. It is, of course, possible to set down some arbitrary rule, assigning to each ton of freight its proportionate share of overhead expenses. Some extremists, perhaps, would even favor doing this. But such arbitrary assignment does not mean at all that this expense is really incurred in moving this traffic, or that the expense disappears if the traffic disappears. The railroads would be harming themselves and injuring their customers if they should decide to haul no shipment except at a rate high enough to cover a "cost" which exists nowhere except in some bookkeeping calculation. With railroad transportation having the peculiarity of a large proportion of overhead expenses assignable only by arbitrary methods, it is natural that both the railroads and the regulatory authorities should have agreed that a larger proportion of this expense should be borne by commodities which could "bear" it, than by commodities which could not bear it.

Anybody who compares transportation costs (realizing that they cannot be definitely assigned) and the prices of commodities, will quickly conclude that it is in the interest of both the public and the railroads to charge much higher rates on some goods than on others. Studies by the Interstate Commerce Commission a few years ago disclosed that the railroad freight rate on tobacco was equivalent at destination to less than 2 per cent of the selling price. On leather the freight rate was only 1¼ per cent of the selling price. On automobile tires it was only 1½ per cent; on cotton cloth 1¾ per cent. By contrast, the freight rate on oranges and grapefruit represented almost 43 per cent of the value of oranges and grapefruit at destination; about 60 per cent of the value of grapes and watermelons; 52 per cent of the value of tomatoes; 56 per cent of the value of bituminous coal; 58 per cent of the value of posts and poles; and 47 per cent of the value of cantaloupes.

From these figures it is quickly seen that an increase of even 100 per cent in freight rates on tobacco or automobile tires would have very little adverse effect on the consumer (or a 50 per cent decrease would do the consumer little good)—whereas an increase or a decrease of only 10 per cent would be definitely noticeable in the delivered prices of melons and oranges. It is in the interest of both producers and consumers to have rates which will encourage goods to move—and such rates the railroads made.

With this viewpoint toward rate-making the regulatory authorities fully concurred. Overhead expense was borne in larger proportion by those commodities which could stand such expense without discouraging their movement. And a smaller proportion of the overhead expense was reflected in the rates on commodities where higher rates would have seriously curtailed the ability of the public to purchase them. Rates were made to "move the traffic," i. e., to assure the largest possible distribution of desirable products to the people.

This condition, however—despite its manifest advantages to both producers and consumers—was one which left the railroads quite vulnerable to any shipper of comparatively high-rated goods who might be able to provide his own transportation—or secure transportation from some agency not regulated by the Interstate Commerce Commission and hence not subjected to government control of transportation prices. The opportunity for shippers thus to use unregulated or self-provided transportation was present at all times along the seacoasts and in the vicinity of the Great Lakes (during certain seasons of the year). The proportion of the nation's total commerce borne on these waterways, however, was not large. The railroads serving these areas made some concessions to the competition there met with, but the amount of it was not sufficient seriously to disrupt the general structure of freight rates upon which a prosperous nation was built.

3 Is a rate unfair if goods move freely under it, and if it does not penalize the consumer or lose customers for the producer; even though, in the interest of preserving a national transportation system, such a rate may carry more than a pro rata share of overhead costs?

And then the Panama Canal was constructed, which meant (especially after the conclusion of the last World War) that private or highly competitive transportation was available between the Atlantic and Pacific seaboards for the benefit of all shippers whose commodities, when they moved by rail, were required to pay a large share of the overhead expense. The goods moved in great volume at railroad rates, but, if the individual shipper could save in his freight bills by using another form of transportation, naturally that was what he was going to do—the maintenance of a system of rates and of transportation in the broad public interest was not his responsibility. The possession by coastal shippers of the opportunity to provide their own transportation, or get it from unregulated competitors, gave them an advantage over producers in the Mississippi valley; and soon the Mississippi

valley shippers were clamoring for inland waterway improvements, which would equalize their opportunity with that of producers on the two coasts to get self-provided or highly competitive transportation. And the Mississippi valley got what it demanded—and more and more areas have been demanding and getting the same thing.

4 When every man, or every group, seeks a transportation advantage through political help, the end result is not necessarily favorable even to the beneficiary, and even less so to the nation as a whole.

Then came the whirlwind improvement of highways all over the country, which has given every shipper the opportunity, if he so elects, to provide his own transportation—and, naturally, this is what he will do if the rate the railroad tries to charge him is in excess of the cost of operating his own vehicles or barges. Thus the ability of rate-regulators to assign a larger proportion of railroad overhead expenses to some commodities than to others (while it is obviously advantageous to the country as a whole) has now very largely disappeared. And the rail carriers are further handicapped by the fact that many basic commodities which have heretofore not borne a pro-rata share of overhead expenses, cannot be assessed with such expenses without increases in prices to consumers which might seriously curtail their production and sale.

Such, in brief, are the salient characteristics of the terrific problem which the railroads face in revising their rates to meet modern competitive conditions. It is not strange, in view of the complexity of this problem, that it has not yet been solved to the satisfaction of all. Rather, it is probably a matter for congratulation that as many constructive steps have been taken in the direction of its solution as have occurred.

The Association of American Railroads has had several committees working on different aspects of this situation—one of them on tariff simplification, another on the classification of commodities and another on merchandise service and rates. The Tariff Simplification Committee has been working for almost five years and in the course of that time has succeeded in bringing about, not only a far-reaching simplification of tariffs, but has eliminated thousands and thousands of pages from them. The committee still has plenty of work ahead of it, and it meets three or four times a year (each meeting of several days' duration) to continue this work. Suggestions for simplification come to it from the various territorial rate associations and, to some extent from shippers directly, and each suggestion is weighed carefully and, if found feasible, a method is prescribed for placing it into effect.

The Classification Simplification Committee was appointed in July, 1939, with instructions to simplify the Classification and substantially reduce its volume. It consists of three members, one each from the Official, Southern and Western Classification Committees, serving on a full-time basis. This Committee is still functioning and it is anticipated that its final report will be made public in the near future.

The Merchandise Commttee was also appointed in the summer of 1939 and worked through March of this year, its final report being made public in April. This committee made some far-reaching recommendations which were approved by the traffic executives and are now in the hands of the various railroads with directions to make them effective. Many of the recommendations of this committee are highly technical in character, but are of importance to shippers of many commodities. Some of the committee's recommendations, however, are of general interest. For example, it went on record in favor of providing "split deliveries" (i. e., delivery to more than one consignee); and in favor of changing Rule 34 of the Classification to make 36-ft. and 40-ft. cars interchangeable at the 36-ft. minimum. The committee also recommended a number of improvements in service—such as later closing of freight houses, the maintenance of merchandise car schedules without discontinuance unless customers are given notice in advance, a provision for "mixed l. c. l. shipments"—making a rate based upon that for all the classes of freight in the consignment and not (as has heretofore been the rule) making the rate on the highest rated commodity.

The Committee also recommended that the Association of American Railroads study the application of portable refrigerators to railroad service, to the end that these devices may be used wherever they are found practicable—and that arrangements be worked out for their interchange between connections, with provision for proper compensation for their use. It also recommended establishing low carload minimum rates where necessary to meet truck competition. It gave guarded approval to rates based on quantity, but recommended that such rates be not generally established pending further developments.

The Merchandise Committee also made a number of recommendations which have not been made public, and which were not adopted by the traffic executives but which were referred as suggestions to the individual railroads in the belief that, while the railroads as a unit are not prepared to adopt all of them, there may well be many individual carriers which will proceed to do so.

5 The Association of American Railroads has had three committees of experts working on simplifying tariffs, modernizing the Classification, and determining ways in which merchandise service may be improved.

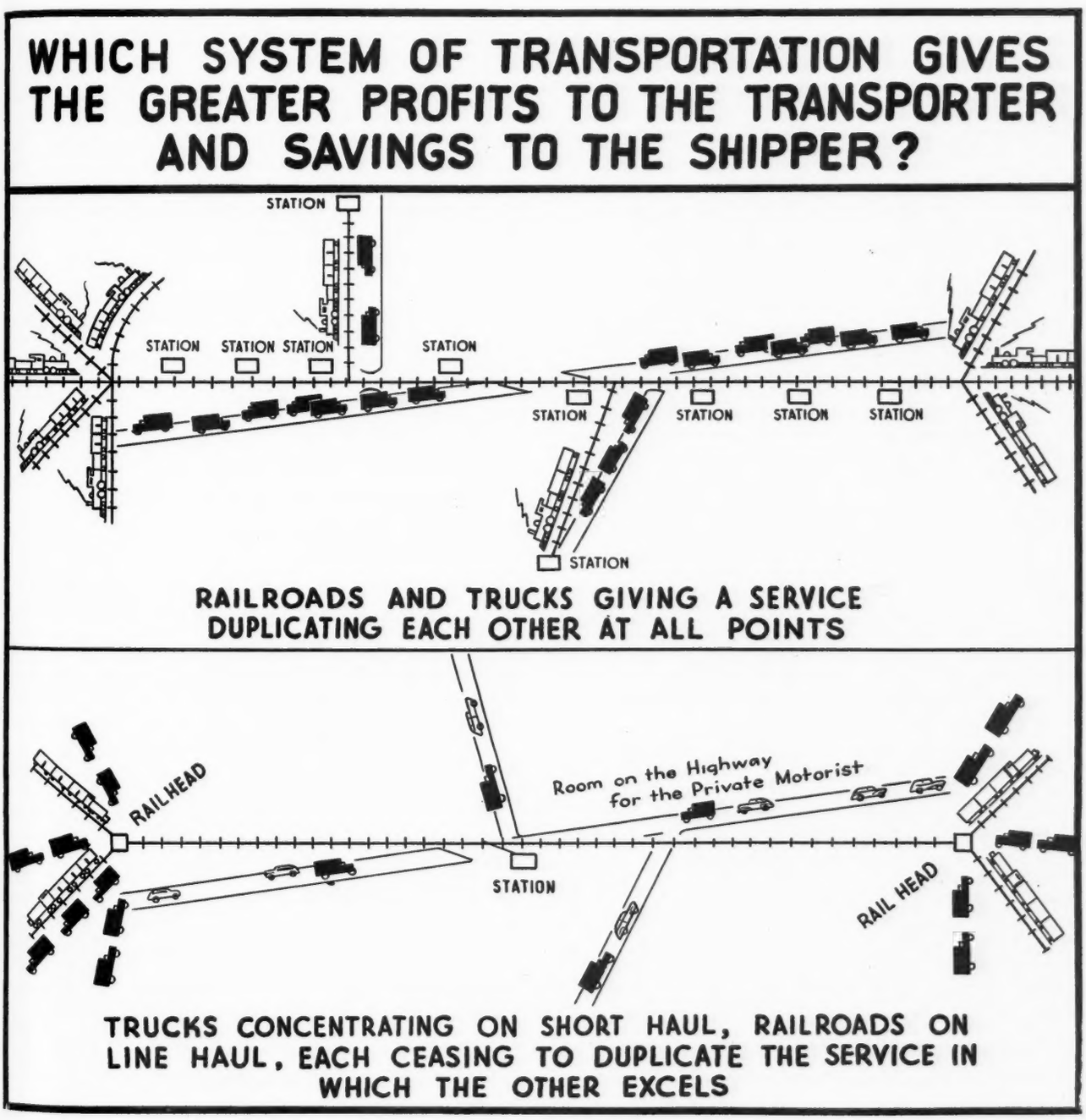
The full class rates on high-rated commodities between centers where movement is heavy have in some cases become "paper rates"—that is, rates under which little traffic is moving. But this is by no means a general condition—the railroads last year moved a quarter-of-a-billion dollars of business at regular l. c. l. rates. Where the l. c. l. traffic has left the railroads, not all of it has gone to the trucks. Much of it is still being handled by the railroads on account of forwarders (shipping by the carload) who, in some cases, have cut under the railroad class rates. Some of this forwarder business is moved by truck, but most of it is still moving by rail. The forwarding agencies, rather than the railroads, however, are getting the credit for the lower rated service—

whereas, actually, forwarder service is simply a device whereby railroads may meet the actualities of the present competitive situation.

Some railroads favor the forwarder device and others do not. Several months ago, for instance, a number of Eastern railroads received permission from the Interstate Commerce Commission to disregard the long-and-short haul clause of the Interstate Commerce Act in order to put in intercity l. c. l. rates which would match the rates being offered by the forwarding agencies. The railroads may be expected to improve their relative position with respect to both trucks and forwarders as they multiply their adjustments in service and rates.

The approach to the problem of meeting truck competition, which has proved most effective in holding or regaining traffic, as expressed by one authority, has been to establish, to the maximum extent possible, complete equalization with the truck competition to be met—both as to rates and service. If the railroads try to meet such competition by rates alone, or service alone, their effort will not suffice. Where it is impracticable to equalize the service, it is necessary to maintain a reasonable differential in the railroad rate under the truck rate, to offset the disadvantage in the service. These realistic principles are, in the opinion of this authority, fundamental—for the reason that the individuality of truck transportation creates a condition where there is a tendency to expand accessorial services which the nature of mass transportation by railroad does not permit.

There have been a growing multitude of experiments by the carriers to meet the new conditions which they face. Some New England railroads recently received permission from the Interstate Commerce Commission to install experimentally l. c. l. rates between relatively nearby points in Massachusetts, Maine and New Hampshire and Boston under schedules which abolish the first four classes of the classification altogether, rating all this


WHICH SYSTEM OF TRANSPORTATION GIVES THE GREATER PROFITS TO THE TRANSPORTER AND SAVINGS TO THE SHIPPER?
STATION
STATION
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STATION
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STATION
STATION
STATION
RAILROADS AND TRUCKS GIVING A SERVICE DUPLICATING EACH OTHER AT ALL POINTS
RAILHEAD
Room on the Highway for the Private Motorist
STATION
RAIL HEAD
TRUCKS CONCENTRATING ON SHORT HAUL, RAILROADS ON LINE HAUL, EACH CEASING TO DUPLICATE THE SERVICE IN WHICH THE OTHER EXCELS

traffic at Column 45. A good many of the roads have established simplified tariff and classification conditions for the movement of l. c. l. intrastate. For example, railroads in the Mountain Pacific area have adopted this expedient and are handling this traffic on a two-class basis.

6 Additional experiments by the railroads to make their service to l. c. l. shippers more convenient and more economical are being undertaken almost daily.

Some Southwestern carriers have established numerous "mixture" rates intrastate on groceries, drugs, dry goods and other such merchandise. The waybill on such a shipment carries only one notation—so many pieces of, say, "grocery mixture" without further description. Such rates are designed to make railroad service convenient to jobbers who send frequent consignments to retailers, each of which may contain a considerable variety of commodities. Many "all-commodity" carload rates have been established in various sections of the country, a type of rate which is particularly useful to forwarding agencies. Such rates are also a boon to shippers of miscellaneous merchandise—such as mail-order houses, chain stores and other concerns which do business in a widely-diversified list of commodities.

There are those who are inclined to be impatient with the railroads for their failure immediately to revise all of their rates to meet modern competitive conditions, forgetting that rate structures cannot be built that way. Freight rates are a *structure* and have to be erected as any structure is erected—one brick and one two-by-four at a time—and the size and shape of each piece of material which goes into the structure has to conform to the requirements of the structure as a whole. Nobody can build a structure if all the risers are cut to different lengths, to suit the momentary whim of the man with the saw. The roof cannot be put on until there are walls.

Also—the work of builders usually will proceed more satisfactorily when the community sympathizes with their efforts. A carpenter or bricklayer can scarcely be expected to do his best work if he has to operate under constant fire from neighboring sharpshooters. One authority enumerates the considerations which must govern a rate-maker as follows:

1. Cost of service.
2. Value of service.
3. Competition; that is, commercial competition between communities and between shippers; also competition between railroads serving the same communities and railroads serving different communities.
4. Value of commodities—risk of loss or damage.
5. Specific needs of industry or locality.
6. All foregoing factors subject to further fact that rates must be "just and reasonable."

Another difficulty arises from the fact that revision of the higher rates to meet competition leaves the carriers with uncompensated losses on rail-bound business which continues to move at old rates; and the business to be *immediately* regained by a general rate revision is problematical. Considering the extreme poverty of the railroads for the past nine years, it is scarcely remarkable that they have been hesitant to take revolutionary chances which might leave them, if even for a few months, with revenues seriously depleted even under recently disastrous levels.

Despite all these difficulties, though, steady progress is being made and the number of railroad men is growing who believe that rate differences between commodities which can not be made to "stick" should be swept away. In general, such rate reformers would *modify all classification of commodities, in the higher-rated brackets where competition is a factor, to differentiate between them only to accord with differences in density, in expense of handling, and in likelihood of loss and damage.*

The "value of the service" principle in rate making would not be discarded, but recognition would be given to the fact that the value of transportation no longer has any very close connection with the value of the article transported. The ability of the shipper to provide his own service has fixed a "ceiling" on the rates any common carrier can charge him, at the cost which he would incur if he provided the service himself.

The railways and the regulatory authorities have not yet wholly accepted this limitation on their rate-making powers, but all steps (or at any rate most of them) which have been taken to cope with the competitive situation represent partial recognition of this principle.

The provision of store door collection and delivery of l. c. l. freight is, of course, also a rate concession, and a most important one on this class of traffic. On a few railroads experimental rates have been provided for the movement of loaded truck bodies or trailers at a flat rate, regardless of contents—the effect of which is substantially equivalent to that of the all-commodity rates, in enabling the railroads to secure forwarder or truck traffic which might otherwise move by highway.

7 The law and shipper opinion require that rate relationships be maintained in a nice balance—but what good is this nice balance if the rates it calls for won't move the goods?

It is not alone with respect to l. c. l. traffic, however, that the railroads have made, and are making, revolutionary changes in their rates. Not only barges, but trucks as well (on a below-cost "return load" basis) have been making inroads into carload traffic and many rate changes have been necessary to meet such competition and, where possible, to hold the business on the rails. The most spectacular of such modifications has been the rate put in by the railroads on black strap molasses between New Orleans and Peoria—where, with a minimum of 1,800 tons, the carriers have been authorized to establish a rate competitive with privately operated barges. A Commission Examiner has recently recommended to the Commission that the trainload basis of rate-making be applied to gasoline to enable independent refiners without pipe line facilities to compete with the big "integrated" companies which own and operate their own transportation. It is too early yet, of course, to predict just what may come of this trainload concept in the field of rate-making. Some believe that its potentialities are great—while others believe that the general adoption of such rates may do the commerce of the country (and, incidentally, the railroads) more harm than good.

The consideration which for many years caused the rate-making authorities to frown upon rates reflecting the economies of trainload quantities was the protection of the small shipper from the large. But, in recent years—by the use of barges and pipe-lines and, to some extent, trucks—the shipper-in-quantity has been getting the advantages of the wholesale character of his transportation, despite anything that the railroad rate structure could do to deny him the advantages of his size. Permitting the railroads to make large-quantity rates simply means ceasing to pretend to restrain the large shipper, when, in point of fact, he wasn't being restrained anyhow. It is difficut to see how the economies of large-scale transportation can be denied big shippers—unless a "commodities clause" were enacted for shippers (as it has been for railroads) forbidding a concern engaged in other business to engage also in transportation (as the railroads are forbidden to engage in manufacturing or mining).

The Black Strap Case is significant also in indicating how far the Commission is willing to permit the rail carriers to go to meet an inland waterway competitor. Another recent decision has indicated the Commission's disposition toward what it regards as the proper border line between railway and highway transportation. The case in which this principle was set forth is No. 27571, the Naval Stores to Gulf Ports case. In this case, detailed cost studies of both railroad and truck transportation were made part of the record. The railroad costs were shown to be considerably lower than those of the highway operator competing for this business, and the railways were permitted to drop their rates to a point well under the truck operators' costs. There were several dissents, in this case, however—some of the Commissioners appearing to believe that rates should be set high enough to enable all competitors—high cost as well as low cost—to get "a share of the business." These dissenting views would scarcely conform to a policy (if there is any such) of securing to the consuming public the "inherent advantages" of railroad transportation. A nice problem in public policy would seem to be involved here—is it the function of regulation to maximize competition on a monopolistic level of prices, or should regulation encourage genuine economic competition to give the low cost operator the business, passing the savings on to the consuming public?

8 As far as competitive traffic is concerned, can classification consider anything except density, likelihood of damage, and comparative cost of handling?

The above are nothing more than the high points of a situation more complex, perhaps, than any which faces the railroad industry, and all persons interested in a prosperous America. It is a situation upon which not only the railroads, but the shippers and regulatory authorities as well, are putting in literally hundreds of thousands of man-hours of high-powered analytical effort. The travail under the best of conditions will not be a short one. The whole freight rate structure has to be worked over from top to bottom—and in a manner, not only to occasion the minimum distortion in existing channels of trade, but also to enable the transportation business to earn enough money to induce private enterprise to put up the capital required to keep it going and serving the country adequately.

9 Should the regulatory authorities, in prescribing rates, permit the most economical agency to use its low costs for competitive purposes? Or should the authorities "fix prices" of transportation high enough to allow the costliest agencies to get "their share" of the traffic?

An arbitrary basis of rate-making and regulation, seeking to keep in operation high-cost services, can in the end serve only to drive the profits out of the transportation industry, while at the same time forcing producers to decentralize and find substitutes for an over-built and over-priced transportation service. Modern-minded traffic officers and public-spirited shippers are faced with a challenge to their intelligence and social-mindedness such as has never before occurred in the history of mass transportation. The growing intensity of activity in this sphere indicates that rapid progress is being made—and nothing can promote such progress quite so effectively as an understanding, sympathetic and appreciate attitude on the part of those who stand on the side lines.

Freight Car Specialties for Speed

(*Continued from page 928*)

and usually depends on the capacity of outside facilities for delivering material to the roof hatches and taking it away from the hopper doors.

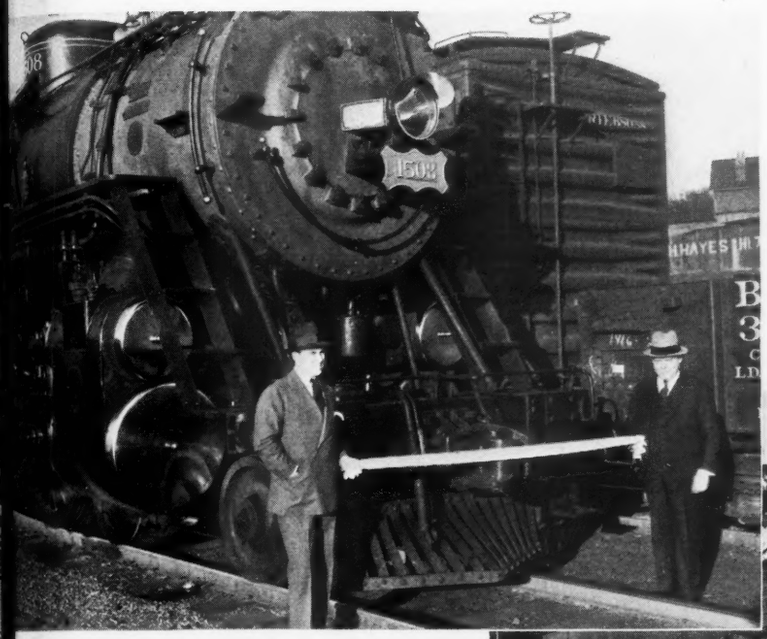
A distinctly different type of car, used for the shipment of dry bulk materials which present some occupational hazard in handling, is the Dry-Flo tank car, illustrated. In this particular design, the car is loaded through six small manholes along the top of the tank and unloaded through another small hopper at the bottom, two endless chain conveyors, operated from machinery in the center dome, serving to draw the material along the bottom center line of the tank from each end towards the middle. With proper precautions, this car may be loaded and unloaded mechanically without any of the material getting into the atmosphere and possibly presenting some health hazard to men who are working nearby.

Other cars with equipment for handling special commodities include heavily-insulated cars for shipping solid carbon dioxide, glass-lined milk cars, multiple-unit tank cars for the shipment of liquid chlorine, helium gas, etc. Taking all things into consideration, the informed shipper can hardly fail to be impressed with the vast amount of engineering knowledge, technical skill and practical railroad experience which have been built into all of these various kinds of freight car specialties and devices with the major objectives of giving him better service at reduced cost.

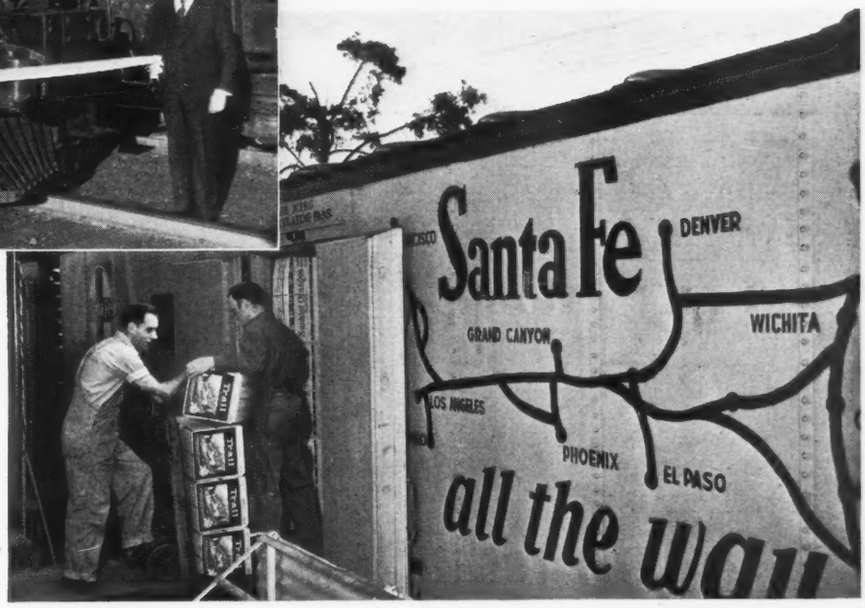
Santa Fe
FRISCO'S FLEET of FLASHES
TEXAS FLASH
OKLAHOMA FLASH
DIXIE FLASH
FRISCO LINES
THE VIRGINIAN RAILWAY COMPANY
FAST DEPENDABLE FREIGHT SERVICE
FAST FREIGHT SERVICE
ROYAL GORGE
MOFFAT TUNNEL
ENIC LINE OF THE WORLD
The Delaware & Hudson
OFFERS A Highly Developed Freight Service
"The DH"
CHICAGO NORTH WESTERN LINE
M-K-T
CANADIAN PACIFIC
FREIGHT
CHESAPEAKE AND OHIO
SCHEDULES
CANADIAN NATIONAL
CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY
The New York New Haven and Hartford RAILROAD CO.
FAST FREIGHT SERVICE
DULUTH, MISSABE & IRON RANGE RAILWAY
Rock Island
FAST
THROUGH FREIGHT SERVICE
SEABOARD RAILWAY
YOU CAN'T BLAME US FOR BEING PROUD!
Southern Pacific
THE ROAD OF THE OVERNIGHTS
NICKEL PLATE ROAD
MINNEAPOLIS & ST. LOUIS RAILROAD
Fast, Dependable Freight Service to and from Important Commercial Centers
When you ship between East and West
M. & St. L. R. R.
Peoria Gateway Best
Elgin, Joliet and Eastern Railway Company
LOUISVILLE AND NASHVILLE RAILROAD COMPANY
NORTH AND SOUTH BOUND
FAST FREIGHT SERVICE
PACKAGE CAR SERVICE
CONNECTING LINE JUNCTION
NEW YORK CENTRAL L.C.L. SERVICE ADVANTAGES
Bessemer and Lake Erie Railroad Company
"Time is Money"
24 HOUR FAST FREIGHT SERVICE TO PACIFIC COAST
6th Morning Delivery
Burlington Route
DIRECT!
...and a hit with shippers everywhere
P.R.R. Door-to-Door Pick-Up & Delivery Service
Call your Neighborhood PRR Freight Agent
NEW 17 MILE TRAINLOAD of ADDED SERVICE for SHIPPERS
2000 MORE CARS TO SPEED NORTHWEST PRODUCTS TO NATION'S MARKETS
Personal Service
C&EI
Chicago and Eastern Illinois Railroad
The BOULEVARD of STEEL
RAILROAD ILLINOIS TERMINAL COMPANY
WESTERN PACIFIC
MISSOURI PACIFIC LINES
Colorful Advertising Supplies an Invaluable Aid to the Sale of Railway Transportation
TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS
HERE'S WHAT SHIPPERS SAY ABOUT UNION PACIFIC DOOR-TO-DOOR Merchandise Freight Service
The South...the Nation's No. 1 Economic Opportunity
SOUTHERN RAILWAY SYSTEM
BOSTON AND MAINE R. R.
NORFOLK AND WESTERN RAILWAY
Highways East!
CHICAGO GREAT WESTERN RAILWAY
The Corn Belt Route
GULF MOBILE & NORTHERN RR
GULF TRANSPORT COMPANY
PERE MARQUETTE Railway
THE RAILROAD THAT CROSSES LAKE MICHIGAN
ERIE RAILROAD SYSTEM
THE HEAVY DUTY RAILROAD
BALTIMORE & OHIO-ALTO
DEPENDABLE
MUSIC TO THE SHIPPER'S EAR

PUTTING PEP INTO RAILWAY SALES

Increased advertising of freight service, new solicitation methods and modern merchandising are bringing traffic back to the rails



New High-Speed Freight Trains Are Christened with Appropriate Ceremonies



The Freight Car Is Now Used as an Advertising Medium on Many Railroads

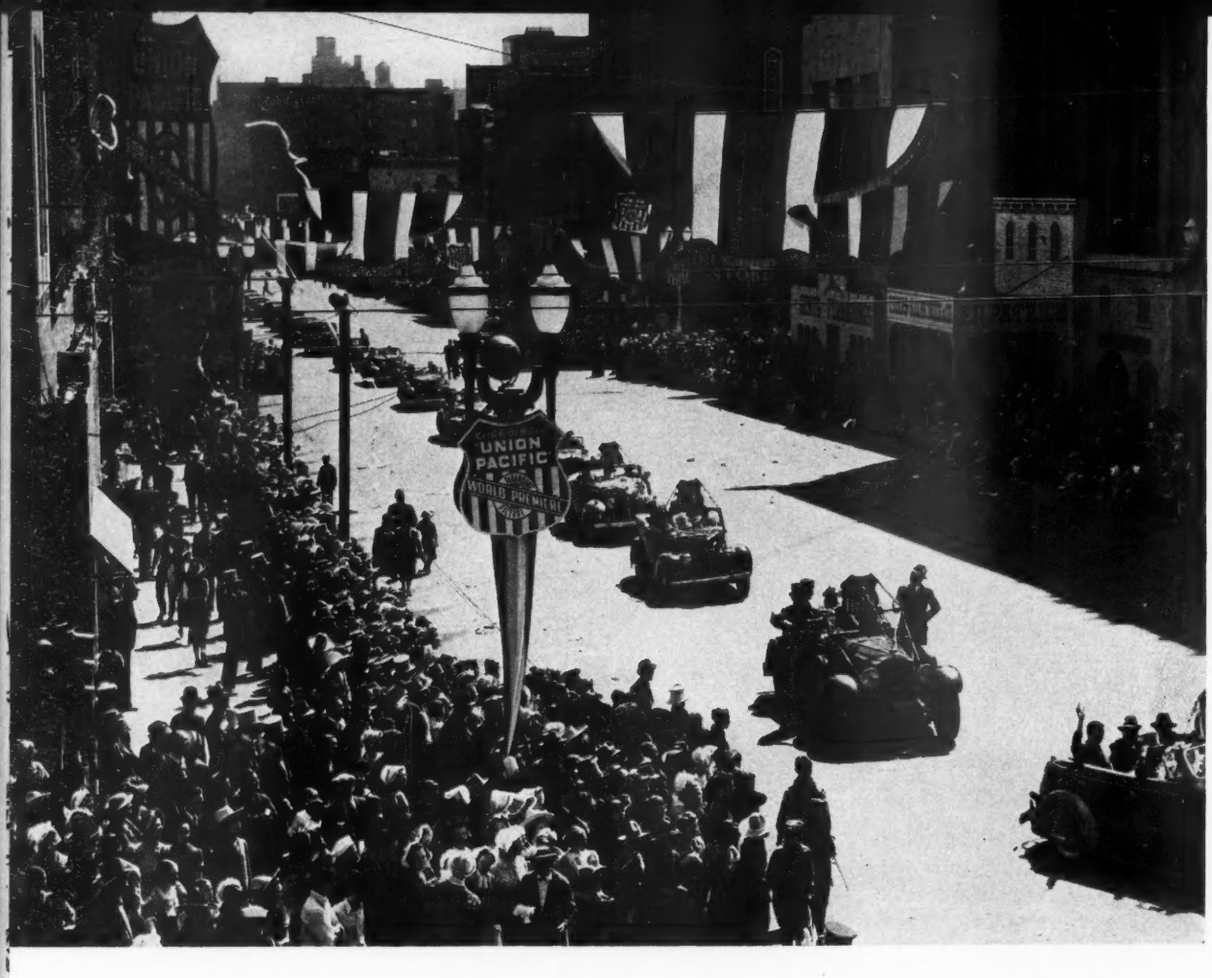
"LADIES AND GENTLEMEN"—the announcer at the public address system at the Southern Pacific station at Glendale, Calif., pauses for dramatic effect. "The next train," he continues, "will be a freight train—a *fast* freight train, so stand well back from the track. It is the Overnight from Los Angeles to San Francisco. Here it comes!" With its gaily painted locomotive working steam—the same type of locomotive that hauls the fast streamlined "Daylight" passenger train—the Overnight rushes past the station at the high speed necessary to make its schedule, and this performance brings hundreds of people down to the station every evening.

In Rutland, Vermont, the temperature hovered around zero, as it frequently does in that northern latitude in winter. A biting wind cut across the station platform, but more than three thousand people braved the elements to come out and witness the ceremonies incident to the first run of the "Whippet," the Rutland's new fast freight train.

These incidents, occurring at such widely scattered points have their counterparts throughout the country and they are extremely significant. Railroading is a dramatic form of transportation—the huge crowds that have passed through the various streamlined passenger trains bear witness to that—and it lends itself to striking pageantry that will catch the public eye. It is only comparatively recently, however, that the railways have come to realize this to the fullest extent and to capitalize upon it to attract passengers and freight back to the rails.

The new streamlined trains are valuable in attracting attention to the railroads, which increases not only passenger traffic but freight traffic as well. Similarly, the transportation of freight in and of itself is capable of sales exploitation and of dramatization—as a glance at the railroad advertising pages in this issue will demonstrate. The old days when freight traffic was taken for granted, when it was a terrible breach of etiquette for a railroad to advertise its freight service, are gone forever; alert and often not-too-scrupulous competitors in other forms of transportation have seen to that.

In the struggle for survival as the country's premier



Such Events as the Colorful "Golden Spike Days" Direct Public Attention to Railroading

transportation agency, the railways have to utilize every assistance available, in the form of advertising, merchandising and new sales promotion methods and, as outlined elsewhere in this issue, these efforts are being backed by new and dramatic freight services, offering the shipper more for his money than ever before.

The necessity for presenting these new services to the shippers increases in magnitude as the competition from other transportation agencies becomes keener. No railroad can afford to overlook the need for an aggressive and intelligent sales campaign today. The railways have a story to tell, one that is capable of vigorous and dramatic treatment. They have not told their story in the manner that other industries have adopted, but a start, at least, has been made. Some railroads made a beginning years ago, others are comparatively recent converts, but today all of them are alive to the necessity for publicizing and promoting the principal product they have to sell—freight transportation.

The New Traffic Set-Up

In this transition, the cigar-dispensing automaton is fast disappearing from the picture as a traffic solicitor. As a matter of fact, one railway president recently expressed the spirit of the times by objecting to the term "traffic solicitors" as being synonymous with "routine order-takers." The railway contact man should not, he maintained, be merely a solicitor, but a traffic representative in all that the name implies—a man able to answer the shippers' questions intelligently from a background of general railroad knowledge as well as a surface familiarity with schedules and routes.

The modern traffic representative must be trained to keep abreast of the new services offered by his railroad, and he obtains routing orders now on the basis of service to the shippers and receivers and a knowledge of the product he is selling, in addition to his former attributes

The Association of American Railroads Conducts a Vigorous and Continuing Freight Advertising Campaign

Mass transportation means modern transportation
YOU'VE heard a lot about the modern wonders of mass production – how it brings down the cost of things you buy—how it makes possible most of the modern comforts we enjoy.
But did you ever stop to think that modern mass production would be impossible if there were no mass transportation to carry the raw materials to the factories and carry the products forth to every corner of the land?
The only nation-wide mass transportation in America is the railroads, with their 240,000 miles of superhighways built and maintained by private enterprise, which link the nation together with bands of steel.
Over these super-highways travel some 1,760,000 freight cars – rolling up an average total of 13,000 miles per car each year.
These cars, linked together in trains and pulled by a single power plant, do a mass transportation job which no other common carrier could begin to handle.
The railroads do this job for an average charge of about one cent for hauling one ton of freight a mile—a shipping cost far less than the average charge made by any other carrier providing general transportation service.
Isn't that what you'd call modern transportation—transportation able to carry all the products that modern factories can produce and modern farms can raise, and do it so smoothly that most people never give it a thought?
When you look at the record of the railroads and the job they are doing, you can see why government should give all "forms of transportation" equal treatment and an equal opportunity to earn a living.
A FAIR FIELD. NO GOVERNMENT FAVOR IN TRANSPORTATION
ASSOCIATION OF AMERICAN RAILROADS
WASHINGTON, D. C.
SEE AMERICA
6
RAILWAY AGE

of good fellowship and wide acquaintanceship. Equally, the industrial traffic manager has changed with the changing times. He is still as thoroughly acquainted with rates and routes as he was before, but, in addition, he has a far greater knowledge of railroad operation and of general transportation than formerly.

This increased familiarity with the machinery which makes the wheels go around on the railways is attributable to a large degree to the formation of the thirteen shippers' regional advisory boards several years ago. Through the medium of the regular meetings of these boards, which are largely attended by railway operating and transportation officers, the industrial traffic manager has formed lasting contacts and friendships with these men which have been valuable to both sides, for, while the traffic officers must effect the sales, it is the transportation and operating officers in whose hands the responsibility for the service lies, and without their co-operation in getting the freight over the railroad, the most cleverly devised sales campaign will shortly become valueless. These boards have been the means of educating the industrial traffic manager as to vital operating and transportation problems, but, equally, they have educated the operating and transportation officers as to the shippers' problems, and have brought about a much closer and highly desirable spirit of co-operation between the industrial traffic managers, the railway traffic representatives and the operating and transportation officers. They have fostered a spirit of co-operation and of "give and take."

The result of this closer contact between the railways' customers and the operating officers is at once apparent on almost any railroad. Formerly, the division superintendent concerned himself exclusively with getting trains over the road and other kindred subjects and it was rare indeed that he had any contact whatever with the shippers in his territory. This situation has been materially changed and it is now considered an important part of the superintendent's duties that he not only supervise the operation of his division, but that he serve as a public relations officer and a good will representative of his railway in the communities on his division. The superintendent who, when he came to town, visited only the station, the shops and the yards is now extinct. He is now to be found, not only in those places, but also uptown, visiting the local merchants and manufacturers, and, frequently, making speeches to the Rotarians and other civic bodies to widen his acquaintanceship and thereby create a friendlier feeling for his railway, and, incidentally, more traffic.

The education of the traffic representative is particularly manifest in his changed attitude toward the solicitation of merchandise traffic. Formerly, he was concerned principally with the amount of tonnage he could secure and his efficiency was gaged not so much by the amount of revenue he was successful in securing for his railway, but by the number of carloads on which he could procure routing orders. If he solicited less-than-carload traffic at all, it was largely incidental to his pursuit of routing orders on carload traffic. This attitude has undergone a radical change. As the amount of merchandise traffic handled by the railways was materially reduced by new competition, a much greater appreciation of the revenue a reasonably loaded merchandise car brings in became much more obvious and definite efforts toward the intensive solicitation of this class of traffic began to be made. On some of the large number of railways having rail-highway subsidiaries the entire solicitation of merchandise traffic has been turned over to the traffic representatives of these subsidiary companies, but, on all railways, the solicitation of merchandise traffic has become much more intensive and it is watched and supervised with a great deal of attention by the traffic executives.

Off-line traffic representatives are also becoming more highly educated regarding the railways they represent. Not more than five years ago, a railway president, on taking over a property, discovered that many of his off-line traffic representatives had not seen the railway for ten to twenty years and a large percentage of them had never seen it at all. He corrected this situation quickly by calling in such representatives at intervals and relays and taking them over the railroad. As a result, they are now far better equipped to sell its transportation service in view of their greater familiarity with what it has to offer.

A number of railways have also perfected arrangements for a more careful selection of their traffic representatives. These lines, in employing young men as clerks in their general and district traffic offices, are now selecting them with the idea that they will eventually become salesmen for the railway. As a result, when vacancies for traffic representatives occur, they are in position to fill them from a personnel whose members have possibilities for a successful sales career, instead of the former hit or miss method of promoting a rate clerk or a stenographer, with little regard to his sales abilities. Some roads, such as the Pennsylvania and the Illinois Central, are selecting young men to serve as traffic "cadets." These youngsters are given a thorough background with particular reference to traffic, but embracing railroading in general, in preparation for the time when they will meet the public as alert and well-informed traffic representatives.

A unique form of sales service established on several railways in recent years is the formation of investigating staffs, christened "knothole gangs." Under the usual set-up, these crews consist of a representative each from the freight traffic, operating and transportation departments and sometimes an accountant as well, who visit all the important stations on the railway. After conferring with the local agent, these men call on the local shippers, particularly those who have been using competing services in preference to the railway.

Railway Exhibits at World's Fairs and Other Expositions Are Selling Railway Freight Service to the Public

They inquire as to what feature of the service causes the shipper to prefer other means of transportation and ask for any criticism of the railway service or suggestions as to what would improve it, so far as the problems of the individual shipper are concerned. They are

not, of course, empowered to deal with rate matters, and many operating conditions are brought up about which they can do nothing. However, experience has shown that such crews dig up hundreds of instances of service difficulties that can be corrected either at once or after relatively minor adjustments of operating methods. Such crews have been found to do splendid work and, in producing hundreds of satisfied shippers, they have amply justified the time and expense involved.

Employee Education

While the men actively engaged in traffic solicitation were being educated toward better sales efforts, a campaign of wide scope has also been inaugurated to educate all other railway employees as well as to assist in selling transportation. One of the bases of this education was making the employee in whatever capacity more thoroughly acquainted with his railway as a whole and the magazines published as house organs by the individual railways have been largely instrumental in bringing this about. Each issue describes the latest developments in the way of service or changes and improvements in the railway plant to bring about better service. Many of the magazines also publish monthly inspirational messages from the president or other executives and every effort is made to bring about a closer acquaintanceship between employees and officers on the railway.

Some railways have adopted the plan of holding general meetings at regular intervals at certain points on the railways, attended by selected employees from every department and from many cities; others hold district group meetings, while still others confine themselves to periodic local get-togethers. All of these meetings have their social as well as business aspects and all have as their basic object one thing—to get more business for the railways. The formation of such "booster" clubs and other kindred organizations has been given exhaustive study by the executives, and the many railways that have engaged in such activities have found the results so successful that they have been continued and expanded. Veterans' organizations, consisting of twenty-year men and upward still employed by the railway or on the retired list, have been in existence for a great many years. Not to be outdone by the younger employees, the members of these organizations have added co-operation and traffic solicitation to their social activities in many instances.

The methods used in employee traffic solicitation vary widely on the different railways. Some encourage direct solicitation of the smaller shippers by the employees, others have a system whereby the employee sends in a "tip" for the traffic department to follow up when he hears of a prospective shipment or a prospective passenger; but all railways encourage their employees to make themselves good citizens in the communities in which they live, and to identify themselves as railway employees on all possible occasions, and particularly when making purchases. The results obtained have been gratifying, as indicated by the business development program inaugurated by the Delaware, Lackawanna & Western. During four years, the results of this program were 30,952 passengers, 19,603 carloads of freight and 12,036 l. c. l. shipments for the Lackawanna—results that are typical of such activities on other railroads.

An outstanding example of the effective jobs that can be undertaken by such employee organizations—and by no other means—is to be found in a survey undertaken a few years ago by the Union Pacific. This road desired to revise its merchandise service to meet the needs of its shippers, but before doing so, personal calls were made on some 10,000 shippers and receivers, from the smallest to the largest, to find out definitely what they want. Such a gigantic task was manifestly impossible for the traffic department alone, and the employees were called in to assist. They made reports on each call, and the resulting 10,000 reports, when analyzed by the U. P. traffic executives, showed the way unmistakably to the establishment of the Challenger freight service.

Advertising Freight Service

When the railways had a virtual monopoly of transportation, there may have been some reason for the lack of advertising of freight service, but, as soon as competition entered the field, it became almost essential that the railways advertise the product they had for sale if they were to survive. Tentatively, at first, largely in trade papers, and later with increasing volume, freight advertising began to be seen, until now it is not unusual to see such advertising in the newspapers and in national magazines. Among the first roads to inaugurate definite and specific advertising campaigns for freight service were the Norfolk & Western, the Atchison, Topeka & Santa Fe, and the St. Louis-San Francisco.

The N. & W. began a national advertising campaign as far back as 1928, and it had its inception in the promotion of the sale of coal from the Pocahontas field. The advertising of transportation was merely incidental in a sense, although the revenue which the N. & W.

A Study in Concentration: Railway Employees in All Ranks Are Becoming Active Workers in Securing Additional Traffic

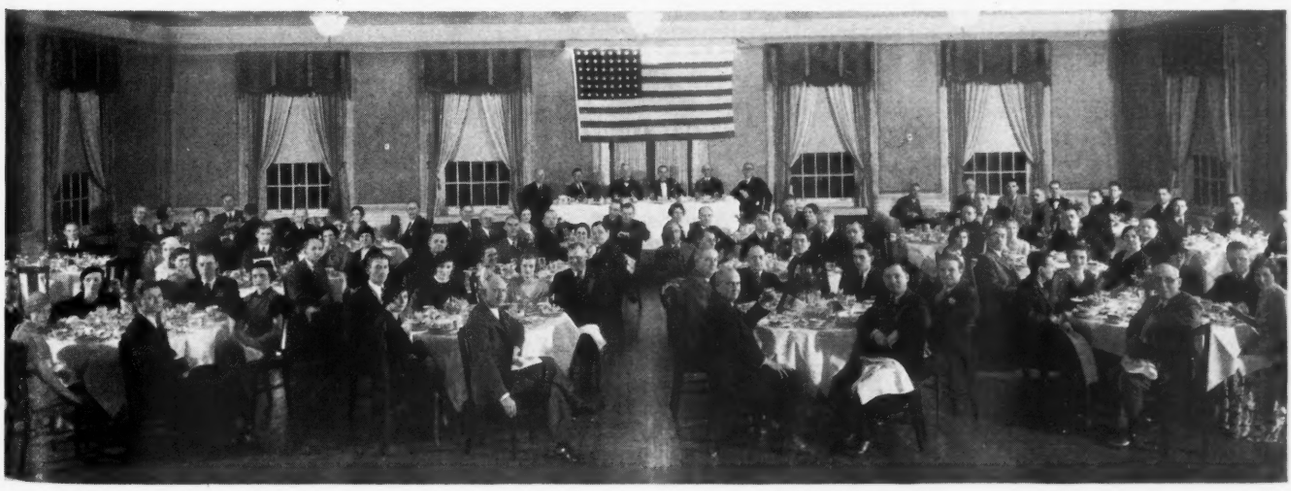
One of the Features of Railroad Week Stops Traffic at the "World's Busiest Corner"

receives for every ton of coal shipped over its rails is considerable, so that any merchandising campaign to help the sale of Pocahontas coal was in the very nature of the business productive of additional revenue for the N. & W. This revolutionary campaign was started in a tentative manner at first, but it took only a very few months to discover that the results were so satisfactory that the campaign has been continued for the last 12 years. A vast amount of space has been used in that time in coal trade papers and in the trade journals of industries using large quantities of coal. In addition, certain business newspapers, for example, in Chicago and Boston, have been used.

As a corollary of this campaign, the N. & W. established eight coal bureaus at various off-line agencies, headed by men who were combustion engineers rather than railroad men, and these bureaus are always at the service of users of coal, to demonstrate the advantages of the coal mined along the N. & W. or to correct any difficulties that may arise because of defective firing. These men give this service not only to industries, but also to householders who are having trouble with their furnaces, and the coal bureaus, backed by the widespread and aggressive advertising campaign, have been responsible for the increased use of Pocahontas coal and for materially increased revenue for the N. & W. from coal shipments. Other coal-handling railways have set up similar bureaus. The Santa Fe, another pioneer in freight advertising, has carried on a well-directed campaign, using various media, for several years past, and has obtained excellent results. The St. Louis-San Francisco employs the services of a publicity organization which has also achieved excellent results in working with the freight traffic officers to publicize Frisco freight service.

More and more media are being used as the value of advertising freight service becomes more and more apparent. The majority of roads are now advertising their freight service in their passenger timetables and many of them publish freight schedules and other pertinent freight information alongside their passenger schedules in the Official Guide. Direct-mail advertising is also being used extensively. Package car schedules and the schedules of hot-shot merchandise trains are now broad-

Employee Get-Together Dinners and Other Social Events Promote Esprit de Corps



cast throughout the country and, taking the cue from the present attractive passenger timetables, many of the booklets containing these schedules are dressed up in an attractive manner typographically and their make-up is given as much attention as the passenger literature. The inauguration of new services, as, for example, a high-speed overnight merchandise service or a new rail-highway co-ordination, is frequently advertised by the printing and distribution of attractive illustrated booklets which give the new services in detail. Freight traffic department literature has by no means reached the volume and attractiveness of passenger folders, but it is growing rapidly, as is evidenced by a distribution of some 25,000 copies of an interesting and well-illustrated booklet describing the new Union Pacific Challenger freight service.

The first tentative efforts at advertising freight service by means of booklets some years ago had little more sales appeal than the average freight tariff, which they closely resembled, but the present day products in the way of booklets and folders measure up very well in sales appeal with those produced by any other industry. The newspaper and trade journal advertising has also undergone a metamorphosis. An Eskimo in an igloo, or the wash-drawing of a yawning hippopotamus may seem, at first glance, to have little to do with railway freight service, yet extremely attractive advertisements have recently appeared over the signature of railways that used these devices, and, according to modern advertising standards, used them effectively and well.

Even the red box car has not been overlooked as an advertising medium. Of course, the Great Northern goat and other trade marks have long been a familiar sight on the road and in the yard, but several railways have gone beyond that recently in advertising their passenger and freight service on the sides of their box cars, which serve as traveling billboards throughout the country. Moreover, certain of the freight cars assigned to several of the fast merchandise trains, notably on the Frisco, the S. P. and the U. P., are now used to advertise the specific train in which they are running, and are distinguished by unusual color schemes and various other devices to attract attention.

A national advertising campaign, intended to increase the public good will toward railroads and to keep traffic on the rails, has been conducted successfully for the last few years by the Association of American Railroads. This has involved widespread newspaper and national magazine advertising and, in addition, various pageants at world's fairs, shows, railroad weeks and other devices intended to foster the public interest in railway transportation. This involves the expenditure of approximately three-quarters of a million dollars annually for advertising in various magazines, including 154 national, business and farm publications, with the total circulation of all A. A. R. advertisements amounting to 173,411,000. In addition, for the year which ends May 31, 1940, distribution has been made of 503,000 posters, 6,856,000 booklets, pamphlets, folders and reprints, and 6,648,000 blotters.

Meanwhile, individual railways have been working along the same lines. The running of excursion trains for railroad enthusiasts to show them shops, yards, trains and all manner of railway facilities has become widespread. Such trains naturally bring in revenue, but this is unimportant as compared with their value in impressing upon the public the drama and the efficiency of rail transportation. The individual railroads have also staged many pageants with the same idea in mind. Last year, the entire city of Omaha, as well as nearly a hundred thousand visitors, turned out for a week's celebration of the premiere of the motion picture "Union Pacific." This promotion was so successful and the reaction to "Golden Spike Days" was so spontaneous that it has been made an annual affair, and, a week ago, it was held again, with the radio star, Gracie Allen, holding her "presidential convention" in Omaha as a feature of the occasion. Such pageants and promotions are of value not only to the individual railroad responsible, but to the industry as a whole, because any activity that helps to publicize the railways, locally or nationally, promotes the chief business of all railways—the handling of freight.

Modern sales methods, particularly with regard to advertising, are spreading rapidly, so far as the railways of this country are concerned. Because of the peculiar nature of the business, but more particularly because of the monopoly they long enjoyed in transportation, the railways remained for many years an anachronism in the most sales-minded and advertising-conscious country on earth. All about them, new industries, and especially the passenger automobile industry, were "lifting themselves by their own boot-straps" by means of aggressive sales and advertising campaigns. The awakening of the railways was somewhat deferred and has been hampered somewhat by the strangling ropes of regulation, but it has taken place, and today, some of the keenest sales minds in the country are to be found in the freight traffic departments of the railways, with the result that effective and successful sales and advertising practices are being initiated widely in behalf of freight traffic.

Big Possibilities of Freight-Car Weight Reduction

(*Continued from page 919*)

there will be a tendency for the proportion of empty car-miles to total car-miles to creep upward, with a corresponding increase in the proportion of tare load to net load in the average freight train. Furthermore, **as the running speeds of freight trains increase, certain items of train-mile operating costs will also tend to increase. These costs will also tend to vary with the gross weight of the train and here again reduced tare weight becomes a matter of importance.**

In 1920 there were 1.04 tons of tare weight in the average freight train per net ton of freight handled. The weight of the cars moved averaged 20 tons each and 32 per cent of them were moving empty. In 1929, 1.32 tons of tare weight were moved for each net ton moved. The cars averaged 21.9 tons tare weight each, and 37.2 per cent moved empty. In 1938, 1.5 tons of cars were moved for each net ton moved. The tare weight of the cars averaged 23.6 tons, and 38.3 per cent of them moved empty.

In the face of this upward trend in the ratio of tare ton-miles to net ton-miles the relatively small number of orders placed for really lightweight cars raises the question as to whether the weight reduction effected by the employment of the new structural materials, by the employment of welding and by refinements in design is to be limited so that the maximum ratio of pay load to gross load will tend to remain at 76 per cent, or whether the full possibilities of these materials and methods for weight reduction are to be realized. The difference between the two limits will be a matter of from three to five tons of dead weight per car, a difference which, if it could be applied to all the cars moved in 1938, would reduce the tare ton-miles per net ton-mile by about 20 per cent, or increase the revenue tonnage in the same gross train load by about 14 per cent.

How Good Freight Service Benefits the Shipper

Transportation Looms Large in the Mind of the Traffic Executive

Many advantages derived from it by industry and commerce have been enumerated by business men

"BUILT to Shippers' Specifications" is no idle slogan. Used by one of the nation's larger carriers in the promotion of its new fast merchandise service, this phrase aptly describes the American trend in freight progress during the last few years. In no other period in the history of the railways has so much emphasis been placed upon the necessity of serving *all* of the transportation requirements of trade and commerce. Today's expedited freight service and all of the other developments of the last decade have resulted in large and varied economic benefits to business in general.

What Industrial Leaders Said a Decade Ago

But the great improvement in railway freight service actually began almost two decades ago—back in the early 20's, soon after the railways of the United States were returned from government operation. The improvement and its effects had become so marked ten years ago that in 1930 the *Railway Age* conducted a survey among leaders in almost every line of industry and commerce, which revealed the unanimity with which they agreed not only as to the extent of the improvement in the service that had occurred, but also as to the number and magnitude of the benefits which general business was deriving from it.

At that time the greatest emphasis was placed by representatives of industry upon the reductions of inventories which increased adequacy and dependability of freight service were making possible—reductions the enhancing of which during the depression years has been made possible by continually increasing speed and dependability.

During the intervening decade railroad management has focused its attention upon bettering freight service to a still greater extent, with the result that the introduction of faster schedules, overnight merchandise trains, co-ordinated rail-highway service and pick-up and delivery from door to door have become nationwide in their application. Each month, each week, brings the announcement of better and more expeditious service. As an apt illustration of the effectiveness of modern railway freight service, this afternoon the buyer of a large retail store makes his selection of goods in the Merchandise Mart, Chicago, and the shipment is delivered at Kansas City, 460 miles distant, in time for sales display the following morning, in accordance with appropriate advertising carried in local newspapers the evening before, before the merchandise left Chicago. Even three months ago that shipment would not have been delivered until mid-afternoon and placed upon display the following day. Thus within three months, 24 hours—a full day—was slashed from the effective commercial schedule. Such is today's freight progress—and such it has been during the years since 1930.

Numerous Advantages to Shippers of Better Freight Service

Important as has been the reduction of inventories through freight progress—the huge annual value of which is especially emphasized in an editorial in this issue—it was in 1930, and has been since, by no means the only benefit attributed to improved railway service. Other benefits specifically mentioned have included:

The release of "capital frozen in transit", through reduction in the time necessary to place shipments in the hands of the consignee, and the consequent speeding up of payments due to the shipper.

The release of capital invested in tank car equipment in the oil industry, and in containers for such commodities as milk, beverages and other liquids, through the increase in the number of miles moved per day by tank cars and containers.

The reduction of operating expenses in manufacturing plants and the stabilization of labor forces, through more accurate scheduling of operations.

Savings effected through shipment by freight where

formerly it was found necessary to ship by express in order to make proper delivery.

The lowering of distribution costs through the general speeding-up of freight schedules and improved co-operation between shipper and railroad. Improved service has resulted in an almost complete elimination of tracing clerks and carload shipment riders.

Reduction of demurrage charges because of the regularity of schedules.

Substantial reductions of loss and damage due to merchandise arriving in better condition, because of more careful handling.

Increased volume of sales in retail stores due to quicker delivery of merchandise.

Widening of potential markets through the speeding up of distribution.

More advantageous allotment of purchases by the enlarging of the field from which supplies may be drawn.

Reduction of expense to the manufacturers of heavy machinery of assembly in the field, owning to the provision by the railroads of special rolling stock for handling such shipments.

More Rapid Turnover of Stocks

"We used to turn our stock about six times a year", said the head of a large department store ten years ago. "Now we turn it about nine times a year on account of quicker deliveries, which makes it unnecessary for us to carry such large stocks of merchandise, waiting for new merchandise to come in."

"The outstanding features in improved railway transportation service since 1922," said the head of a large department store in 1930, "are the speeding up of freight trains about 20 per cent and the inauguration of regular scheduled service for freight trains by 95 per cent of the carriers. We are thus enabled to obtain our merchandise quicker, and, in addition, guesswork as to when freight will arrive at its destination has been reduced to a minimum." In 1940 as compared with 1922 the average speed of freight trains has been increased over 60 per cent.

"Perishable merchandise consisting of produce and fruit has had a decidedly improved service from the point of origin," said one large shipper, "also schedules have been maintained and improved materially between shipping points and our branch stores." The handling of perishables has been improved much more since this was written in 1930 than before.

"I attribute a large part of our increasing business to the fact that we can effect quicker delivery to the customer because of this improved service on the part of the railroads," said the head of a large mail order house. "The establishment of increased package car service locally between various gateways has been of immense benefit to industry," said the head of another large mail order house. "Our company, with its regional mail order stores, warehouses and retail stores in every section of the country, has derived great advantage from improved transportation in supplying the needs of its millions of customers."

"We have been able, during recent years, to figure on lower stocks of materials, due to the excellent regularity of movements over the railroads," said a large manufacturer. "While we know we have saved considerable money and time, it would be an endless task to determine the amount of savings involved."

Special Equipment Furnished for Heavy Machinery

"In the heavy machinery business," said another large manufacturer, "the one outstanding necessity is suitable equipment for the ever-increasing loads and sizes of machines. To this end we have had the fullest co-operation of the carriers in building specially-constructed cars to handle machinery, making it possible to build in our plant considerably larger machines than heretofore, without the expense of dismantling and reassembling in the field where the facilities are inadequate."

"The benefits that have been derived," said a steel manufacturer, "are principally through (1) reductions—averaging 15 per cent per annum—in the maintenance of material, stocks, and the consequent release of capital for other purposes and for income; (2) better control of our yard operations, and through elimination of car detention and car demurrage charges; (3) reduction in yard clerical forces; (4) adequate car supply, faster running time, pooling of switch movements in terminal facilities, which have contributed to regular deliveries that to a large extent have met the requirements of our customers and, in some instances, have prompted repeat orders. The economic value to us would represent a very large figure."

"Approximately 97 per cent of our outbound tonnage moves in tank cars under railway tariffs which place on the shipper the burden of furnishing the railway equipment," said the head of a large oil company. "We meet that burden through investment and lease of railway cars, and the burden is made easier by quicker and dependable service, in that such improved service tends to decrease the number of cars required."

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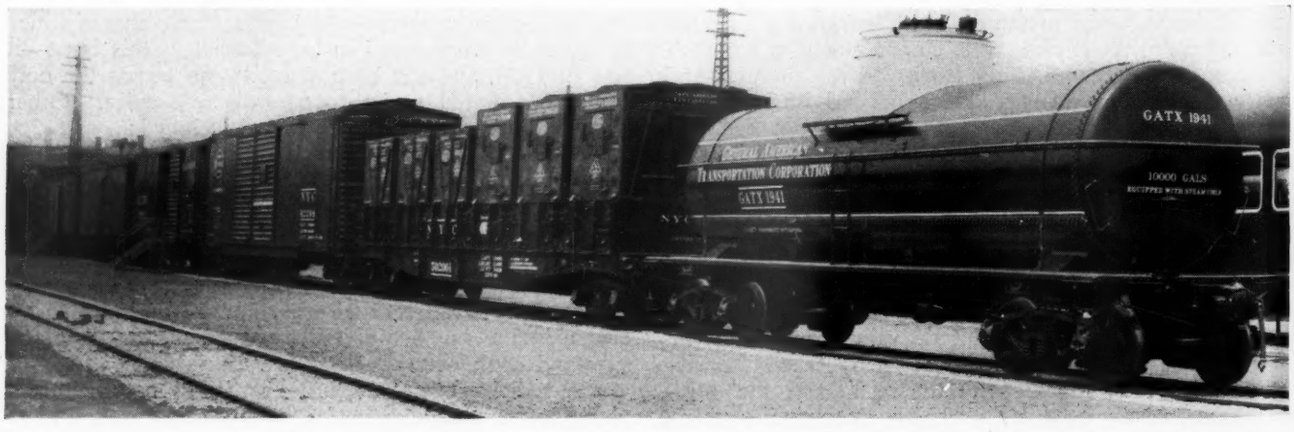

A String of Varied Rolling Stock at the New York World's Fair Track Exhibit

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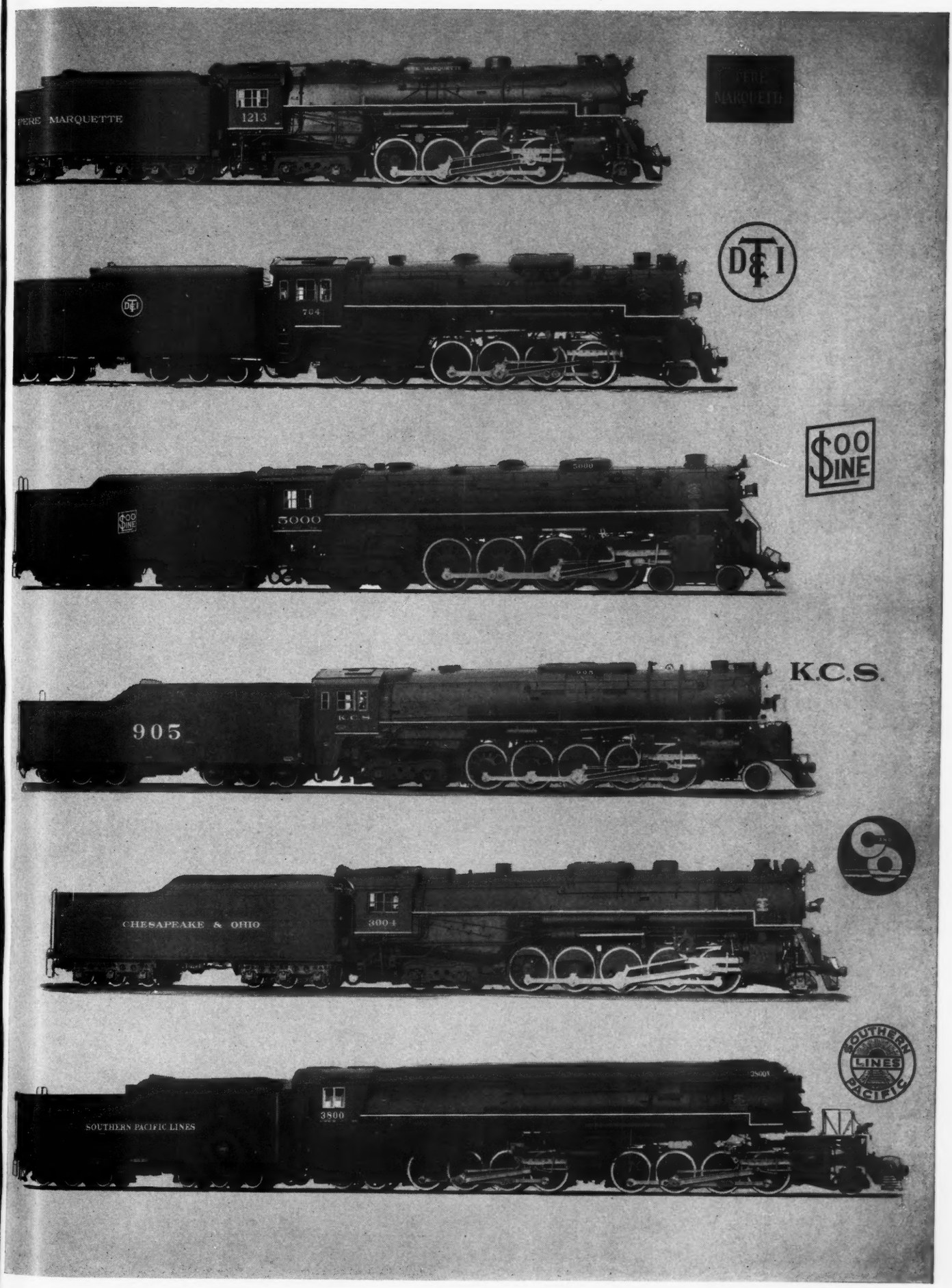
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SOUTHERN PACIFIC LINES

NEWS

Barge Line Not Very Jubilant

Reports a loss of $300,000, admitting it is only a wet-weather facility

The annual report of the government-owned Inland Waterways Corporation for the year ended December 31, 1939, which, as noted briefly in last week's issue, has been submitted by President Chester C. Thompson to Secretary of Commerce Harry L. Hopkins, is a brief matter-of-fact document which contains little of that pointing to the "benefits" of waterway transportation and answering of criticisms which characterized the annual reviews of Mr. Thompson's predecessor, Major General T. Q. Ashburn. Nevertheless the accompanying report of Secretary-Treasurer Guy Bartley makes the usual reference to the "savings to the public" on traffic handled by I. W. C., Mr. Bartley saying that he had been advised by the Corporation's vice-president that such "savings" in 1939 amounted to $2,043,000, bringing the "total savings" from June 1, 1924, to December 31, 1939, to $32,955,000.

Meanwhile, as noted in last week's issue, the Corporation's 1939 operations resulted in a net deficit of $299,949.51 as compared with a 1938 net income of $1,105,449.71. President Thompson pointed out that he had been in charge of I. W. C. for only the last six weeks of 1939. As noted in the *Railway Age* of November 18, 1939, page 796, he was appointed to succeed General Ashburn when the latter was ousted by former Assistant Secretary of Commerce J. Monroe Johnson (now a member of the Interstate Commerce Commission) at the direction of Secretary Hopkins. It was indicated at the time that the general and Mr. Johnson made no progress in developing harmonious relations when the I. W. C. was placed under the latter's direction after its transfer from the War Department to Commerce.

The "unprecedented combination of adverse situations" blamed by President Thompson for the poor 1939 showing included a 21 per cent drop in tonnage as compared with 1938, increased labor costs growing out of the settlement of a strike and more liberal leave allowances to certain employees. The drop in tonnage was due to low water conditions, necessitating abandonment of service on the Missouri river for four months and curtailment of service on other rivers; also, to suspension of service on the Warrior river while new locks were being installed last August. The total traffic handled last year amounted to 1,894,916 tons, as compared with 2,395,454 tons in 1938.

To improve the Corporation's relations with its employees, Mr. Thompson appointed a labor relations adviser who has since January 1 "been in constant touch with the employees and the Corporation and an earnest effort is being made to adjust any and all grievances in a fair and expeditious manner."

Excerpts reproduced from the report of the general traffic manager state that "diversion of tonnage from the Corporation to competing rail lines was not of particular consequence except in the case of sugar where the system of refunds out of transportation charges on raw sugar had the effect of reducing rail rates." Meanwhile, the traffic manager went on, "the Corporation did not fare so well at the hands of competing water carriers, particularly the contract carriers . . . "

The Corporation would seem to be going in for a bit of technological unemployment when it notes its efforts "to mechanize and reduce the number of handlings of freight." However, "the purpose of these improvements in methods is, of course, to permit the Corporation to reduce its handling costs by more efficient utilization of the services of its employees; the intent being to handle more freight with a given number of employees, rather than to reduce the number of employees."

In concluding Mr. Thompson pointed out how he had taken steps which are expected to reduce annual expenses by approximately $85,000 "without impairing the efficiency of our operations." Included in such economies will be a saving of $16,000 effected "through the disposition of the so-called business boat 'North Star'." The latter is presumably a reference to the yacht which figured in discussions of the Ashburn ouster, Commerce Department officials having stated that such a boat had been purchased for I. W. C. by the general. At that time, however, as noted in the *Railway Age* of November 25, 1939, page 829, the annual cost of operating the boat was put at $30,000.

Fourth-Section Relief to Meet Barge Competition for Scrap Iron

The Interstate Commerce Commission, Division 2, has granted relief from the fourth section's long-and-short-haul clause to permit the establishment of barge-competitive rates on scrap iron, in carloads, from Minneapolis, Minn., St. Paul and Minnesota Transfer to St. Louis, Mo., East St. Louis, Ill., and Federal. The decision authorizes a rail rate of $3 per long ton, as compared with a present rate of $4.03; total charges by barge are calculated in the report to range from $2.49 to $2.91.

Union Presses "Make Work" Bill

Bibulous passengers alleged reason why conductors are needed on sleepers

A Senate subcommittee headed by Senator Minton, Democrat of Indiana, which held hearings on May 15, 16, and 17 on S. 3798, a bill which would require the Pullman company to service its cars in overnight runs with a Pullman conductor, heard marked differences of opinion as to the amount of drinking and drunkenness which is currently taking place in sleeping cars. The bill, which was introduced by Senator Minton on behalf of the Order of Sleeping Car Conductors, would put an end to the current practice of the Pullman Company of placing porters in charge of cars on lines where only one or two Pullmans are used because of the small amount of traffic. In these cases the porters collect tickets in addition to performing their regular duties. Testimony on behalf of the company brought out the fact that this added duty takes not more than 10 minutes per car.

Representatives of the Pullman conductors, including Charles M. Hay, counsel; M. S. Warfield, president of the Order of Sleeping Car Conductors, and Pullman conductors I. Johnson, of Los Angeles; M. B. Cunningham, of Fort Worth, Tex.; W. M. Slye, of Washington, D. C.; and A. G. Wise, of Jacksonville, Fla. all testified that there had been since the repeal of prohibition a "shocking increase" in drinking among train passengers, especially women. In effect, it was their contention that because of this and other reasons, the presence of a Pullman conductor was necessary to protect passengers from molestation.

On the other hand, Champ Carry, operating vice-president of the Pullman Company, told the subcommittee that he did not believe that "we have become a nation of drunkards" as, he pointed out, had been suggested by various conductors who had testified. After declaring that these cases of drunkenness were unusual and did not happen every day, he went on to point out to the committee that in each case testified to by conductor witnesses where there had been difficulty in quieting drunken persons, Pullman conductors had been present. It was also his belief that porters were capable of handling any situation of this type that happened to arise.

Mr. Carry also resented an attack, which he said, had been made by the Pullman

(*Continued on page 955*)

RRs Seek Freight, Not Just Love

Judge Fletcher cites Rutland as object of deep affection but not much traffic

"An unexpected and inexplicable alliance between certain waterway opponents of regulation and certain railway labor unions" was what put the Wheeler-Lea transportation bill on the shelf—so Judge R. V. Fletcher, vice-president and general counsel of the A. A. R., told the National Association of Credit Men, meeting in Toronto on May 22. Judge Fletcher in the course of his address questioned the justification of the St. Lawrence Seaway project, and touched upon the regulation of competing transportation and the treatment accorded to the railways by business men.

As exemplifying the latter, he cited "the manifest reluctance of the people in Vermont to give up the Rutland Railroad, a line which is slowly but surely being drained of all its vitality by the competition of highway vehicles. As the road faces abandonment, the patriotic citizens of Vermont manifest their anxiety by offering to do almost anything except give the unhappy railroad their patronage or lighten its burden of taxation.

"An even more striking illustration is afforded by the practice of the shippers of commodities moving in bulk in large volume of patronizing, wherever possible, contract carriers on the inland waterways, with whom they drive hard bargains for shipping rates, undisclosed to the general public and unknown to their competitors, who by reason of location or for some other reason, must use the rails. This extensive use of subsidized water lines does not inure to the benefit of the consumer, often hard pressed to earn a bare living.

"It is now well established that those who use the unregulated water carriers fix the selling price of their product upon the basis of the rail rates, which they do not use. Whatever difference there is between the rail rates and the privately negotiated water rates goes into the pocket of the seller as an extra, unearned profit. **It is not difficult to understand the bitter opposition to regulation of certain important shippers by water.** It is not that they fear an increase in rates; **what they fear is that, the rates of a regulated industry being known, the present practice of selling on the rail cost will become difficult."**

On the subject of regulating the transportation competitors, that traffic may be divided among them on economic lines, the speaker said:

"No one would doubt that on the Great Lakes, the movement of iron ore can best be made by boats. All would agree that within certain limits, household goods can be most cheaply and most conveniently moved by truck. No one can assert that the rails are not the best way of shipping lake cargo coal from the Pocahontas coal-producing region to the lower Lake ports. But there is a large amount of traffic about which there is room for argument, although a careful study of conditions may go far to reduce the volume of business that is on or near the 'border line.'

"How shall we determine what is the proper assignment of each class of traffic? I know of but two ways. One way to do it would be to repeal all regulatory statutes and let them fight it out, in the certainty that the fittest would survive. I am predicating this assumption upon the premise that all subsidies are withdrawn and each transport agency stands stripped for the race, with no artificial stimulants.

"The other method of making progress toward some orderly system of co-ordination is to place all competing forms of transportation under the regulating authority of some competent government agency like the Interstate Commerce Commission, qualified to give aid in the delicate and selective task of requiring each operation to occupy its proper sphere. Again, obviously, if this method of handling is adopted, all competitors must be placed on an equality in the matter of aids and handicaps, so that the conditions of the contest may be fair. It would seem, from our experience of the past 50 years, that the trend of public sentiment has been toward an intensification, rather than a relaxation of regulation."

Judge Fletcher emphasized the peculiar importance of the railways in time of war because they are "the only agency that is in a position to handle every article of commerce to every section of the country on every day of the year." The motor, water and air carriers, he pointed out, are "specialists in certain limited fields. They are able to select their traffic—the selection being determined by limitations of distance, location, capacity and condition of the weather." He cited specific instances during the past year when weather conditions put a stop to forms of transport other than the railroads.

Yucatan of Mexico to Be Standard Gage

The Ferrocarriles Unidos de Yucatan will be converted to standard gage from Merida to Campeche where it will connect with the Campeche-Puerto Mexico standard gage line now under construction. The Department of Communications of the Mexican government has agreed to cede to the Ferrocarriles Unidos de Yucatan the ten per cent tax on gross income to defray the expense.

Forwarder-Bill Hearings June 3

Hearings before the sub-committee of the Senate committee on interstate commerce which is considering S. 3665 and S. 3666, the forwarder regulation bills, have now been tentatively set for June 3. As noted in last week's issues these hearings, originally scheduled for May 24, were postponed because two members of the sub-committee—Chairman Wheeler and Senator Reed—were scheduled to be away from Washington this week.

The hearings will open with a presentation by representatives of the Interstate Commerce Commission, after which the railroads, the forwarders and shippers will be heard in turn.

"All-Freight" to South O. K.

Examiner favors rate device as useful measure in meeting competition

Noting the contention of shippers that "all-freight" rates "have become an integral part of the transportation system," and the position of respondent rail carriers who feel that the cancellation of such rates would cause them to lose traffic and revenue, Examiner L. Way has recommended in a proposed report that the Interstate Commerce Commission approve such rates from Chicago and Mississippi and Ohio river crossings to points in Southern territory. The examiner would, however, require that the tariffs carrying the rates be modified to meet objections set forth by the commission in a previous all-freight rate case wherein it was pointed out that the failure to graduate the schedules according to the capacity of the cars accorded lower charges to the shipper in a position to ship two or more cars on one bill of lading.

Meanwhile Mr. Way would permit the respondent motor carriers to publish the same minima as the railroads, even though more than one truck is used to handle the traffic. This proposal is justified on the basis of language found in the commission's recent trainload-rate decision, Molasses from New Orleans, La., to Peoria and Pekin, Ill. The language cited is: "We find that there is nothing unlawful in the establishment of railroad rates on a quantity larger than a carload, when moving as a single shipment, where, as here, they are designed to meet competition from other modes of transport whose unit of transportation is not limited to single carloads, provided a just and reasonable relation in rates as between larger and smaller quantities of the same traffic is maintained."

The proposed report is in No. 28323 and it embraces also I. & S. No. 4315, All-Freight from Chicago and St. Louis to Birmingham; I. & S. No. 4644, All-Freight, Chicago and St. Louis to Jacksonville; I. & S. No. 4662, All-Freight, St. Louis to Pensacola; and I. & S. 4672, All-Freight, St. Louis District to Memphis, Tenn. As pointed out in the *Railway Age* of September 16, 1939, page 422, where the order launching the general investigation was reviewed, the probe was designed "particularly to ascertain the effect of the said rates upon carrier revenues; upon their relation to other railroad rates applying to the transportation of similar or competing articles of freight; upon transportation costs borne by individual shippers and receivers of freight; upon expeditious railroad service; and upon rates maintained by competing forms of transportation . . . "

Specifically, the examiner's recommended findings are set forth as follows: "(1) That the rate proposed in I. & S. No. 4672 of 40 cents, minimum 30,000 pounds, from St. Louis to Memphis, would result

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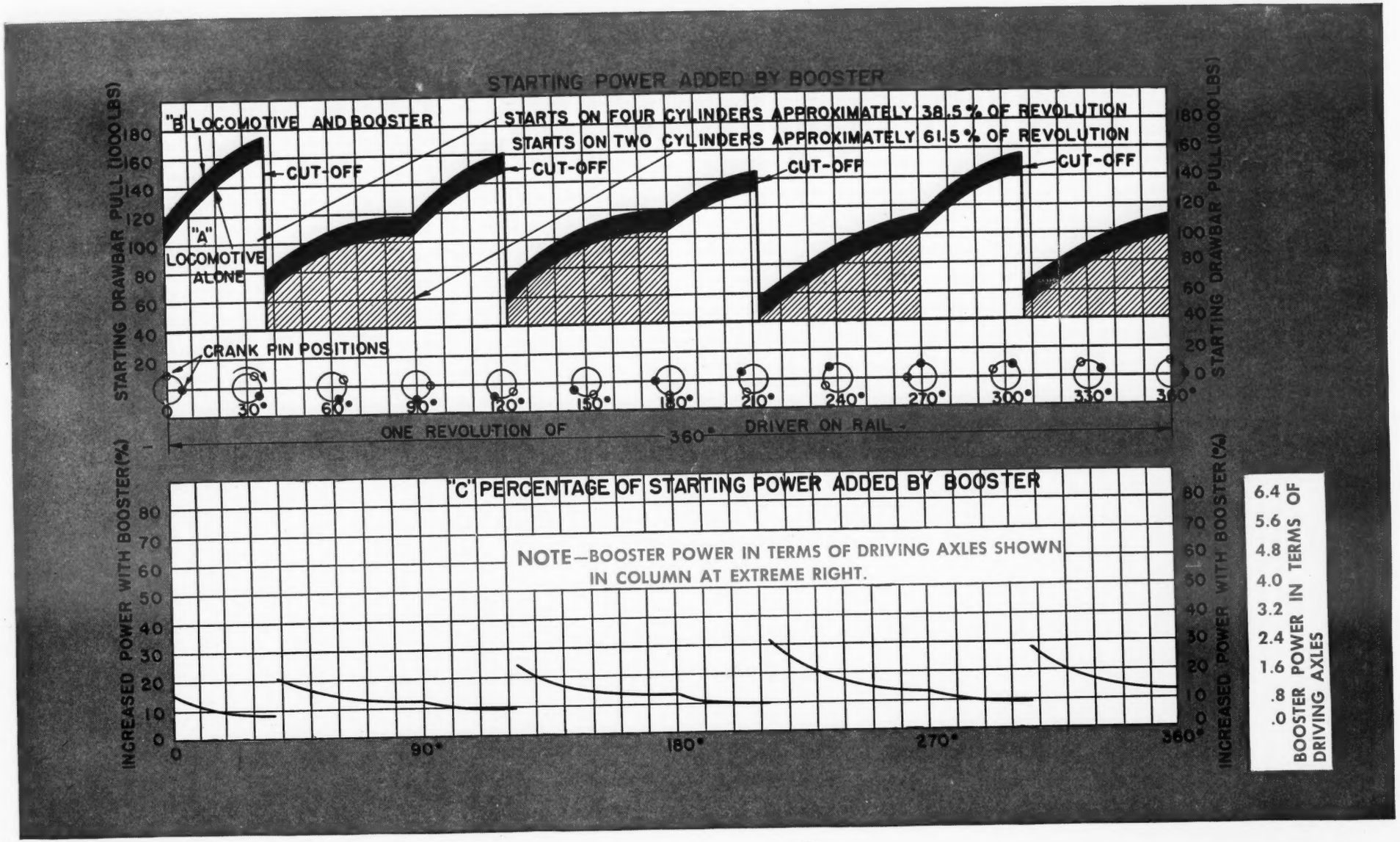


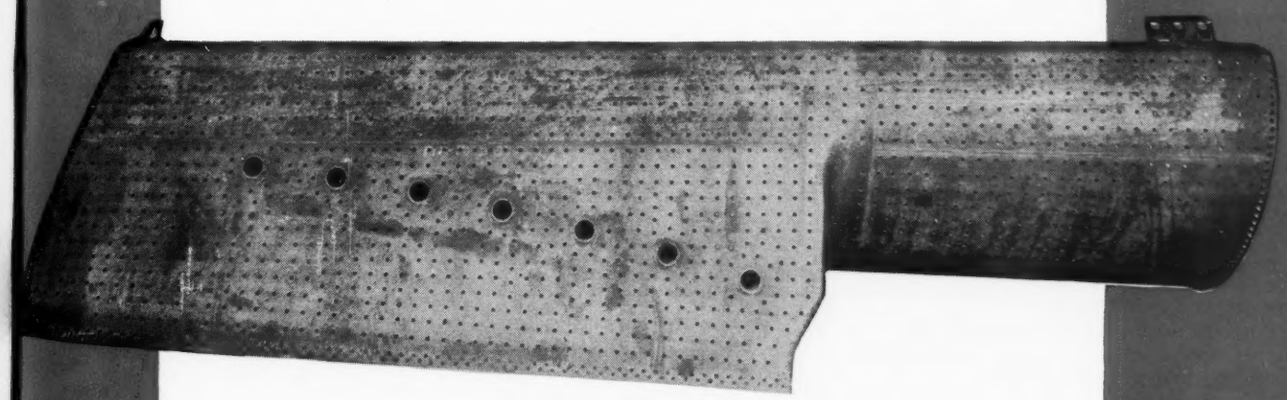
THE BOOSTER* ON MALLET LOCOMOTIVES

for YOUR LOCOMOTIVES

THE demand for greater boiler horsepower brought about the larger firebox, which in turn presented a problem in arch brick support. To meet this condition The American Arch Company, in its continuous study for the improvement of combustion, developed the Security Circulator. While the original object of improved support was achieved, many other benefits have accrued.

Notable among these is the reduced cost of maintaining the arch as compared with other forms of arch brick support. Boiler maintenance is also lessened due to the reduction of honeycombing and cinder cutting. As for the Security Circulator itself, experience has shown a gratifyingly low maintenance cost.

The 524 Security Circulators, that have been installed on 105 locomotives during the last five years, have attained a record of nearly 4,000,000 engine miles of service, in which their performance has been thoroughly proved.



Exterior view of firebox of American Railroad's 6-4-4-6 locomotive showing positioning of Security Circulators.

COMPANY, INC.

NEW YORK CHICAGO

Big Merger of Eastern Trucks

Former General Motors official heads combine financed by Kuhn, Loeb & Co.

The merger of some 25 large Eastern trucking concerns which had gross revenues of $40,000,000 in 1939 and a net income of $3,000,000 after taxes has been undertaken by the formation of The Transport Company, New York, which filed the first of three applications to acquire constituent companies with the Interstate Commerce Commission on May 15. The companies which will eventually make up the combine operate in the territory comprising roughly the New England, Trunk Line and Southeastern railroad freight associations. At present they employ approximately 30,000 persons and operate about 14,000 highway vehicles.

Capitalization of The Transport Company will be approximately $25,000,000, of which from $12,000,000 to $15,000,000 will be new preferred and common stocks for public distribution sometime in the fall through an underwriting group headed by Kuhn, Loeb & Co., New York, while the remainder would be securities held by private interests controlling the present constituent companies. Capital stock will be issued in an amount sufficient to purchase stocks of the present operating concerns and provide not less than $1,500,000 for new working capital.

The application filed on May 15 asks authority to acquire control through stock ownership of the following companies: Arrow Carrier Corporation, Paterson, N. J.; York Motor Express Company and R. F. Terminal & Warehouse Co., York, Pa.; Kirby & Kirby, Inc., and Waverly Place Company, Trenton, N. J.; Mundy Motor Lines, Roanoke, Va.; Consolidated Motor Lines, Inc., of Connecticut and its affiliated Consolidated Motor Lines, Inc., of Massachusetts; United Sales & Manufacturing Co., and United Armour Express, Inc.; Motor Haulage Company, Inc., New York; and Brooks Transportation Company, Richmond, Va.

In addition it asked authority to purchase the Super-Service Company, Nashville, Tenn., for cash. Other operators, which have signed up and for which authority to purchase will be asked later include: Horton Motor Lines, Charlotte, N. C.; Barnwell Brothers, Burlington, N. C.; Transportation, Inc., Atlanta, Ga.; and Branch Transportation Company, New York.

It is planned that the operating identities of the acquired companies will be preserved for the time being but that their executives and owners will serve as active directors of the combine. B. M. Seymour, president of Terminal System, Inc., a large taxicab operator in New York and former manager, New York branch, General Motors Truck Company, heads the new organization. He succeeds M. W. Potter, former I. C. C. member and early president of the Clinchfield, who served as president of The Transport Company during the formation period. C. E. Cotterill, New York, is general counsel, and Coverdale & Colpitts, New York, are consulting engineers.

Rail Labor Starts Move for Vacations with Pay

Railway labor executives, meeting in Washington, D. C., last week, got going on a drive for vacations with pay—"one of the most important movements ever launched by the Standard Railroad Labor Organizations," according to the current issue of their organ, "Labor." The proposals, it it stated, "will be placed before the carriers in the usual way, and it is hoped parleys will begin in the near future."

The report further points out that while "there is most complete harmony between the chiefs," it was nevertheless agreed that different conditions of employment warranted the drafting of two separate proposals—one for the five transportation brotherhoods, and another for a group of 14 other unions. The American Train Dispatchers' Association, whose members already have vacations with pay, are not participating.

Meanwhile the meeting also considered plans to work for the passage of pending bills requiring pipeline companies to obtain certificates of convenience and necessity from the Interstate Commerce Commission for new construction and extensions.

I. C. C. Won't Reconsider Express Agency Status Case

The Interstate Commerce Commission has denied the petition of the Railway Express Agency for reargument before and reconsideration by the entire commission of the case involving R. E. A.'s status under the Motor Carrier Act. Division 5's decision in this No. MC-66562 proceeding was reviewed in the *Railway Age* of January 13, page 137.

Historical Society Bulletin Features Hard-Coalers

Bulletin No. 52 of the Railway & Locomotive Historical Society features an 18-page article on the development of the anthracite-burning locomotive by P. T. Warner, of the Baldwin Locomotive Works. Copiously illustrated, it describes hard-coalers ranging from the B. & O.'s "York" of 1831 to the double-cab speedsters of the Reading and Lehigh Valley at the turn of the century which marked the height of their development. Shorter articles on the Norfolk & Western; the West Point Foundry; the recently abandoned Uintah road; W. F. Harden, founder of the express business; the New York & Greenwood Lake; the abandoned Fairchild & Northeastern and a further installment on "Locomotives of the New Haven Railroad" comprise the remainder of the bulletin.

Vote to Boost Jobless Doles

Senate subcommittee okays bill it got from Wagner who in turn got it from unions

A Senate interstate commerce subcommittee on May 17 voted to report favorably to the full committee S. 3920, a bill introduced by Senator Wagner, Democrat of New York, at the request of organized railroad labor, which would increase unemployment insurance benefit payments under the Railway Unemployment Insurance Act by at least 100 per cent and would make several changes in the procedure of administering the law. As pointed out in last week's issue, hearings were held by a subcommittee headed by Senator Wagner on this bill and S. 3925, a bill introduced by Senator Gurney, Republican, of South Dakota, which represented the carriers' views on the liberalization of the law. The latter measure would increase benefit payments by some 25 per cent and would have set up a merit rating system so that the tax on the railroads' payroll would have been gradually decreased if their employment record continued to be as satisfactory as it has been since the law went into effect some two years ago.

From an examination of the subcommittee's version of the measure it appears that it made almost no changes of any importance in the original bill of Senator Wagner. Certain clarifying language was added, but basically the 100 per cent increase in payments was included as were certain procedural amendments desired by the Railroad Retirement Board which administers the law. Left out was any mention of the merit rating system or a reduction of the tax which was asked because of the fact that the present three per cent tax is more than adequate to support the present payments as is evidenced by the fact that there is now more than $125,000,000 of a surplus in the unemployment insurance account in the United States Treasury.

A memorandum prepared by the subcommittee states that S. 3920, the labor bill, provides for and is primarily concerned with increasing benefits. Under the bill as approved by the subcommittee the weekly benefits are raised by from 34 per cent to 75 per cent, depending on the wage level or an average increase of about 45 per cent. Moreover, the normal duration is maintained with a provision for extra duration for qualified employees with good unemployment records.

Also, under the subcommittee's bill, the waiting period is reduced making possible a reduction in the interval between first unemployment and the first payment of benefits from 38 days to 22 days.

Benefit payments during the current year would be increased from about 25 per cent of income to about 43 per cent of income—not an excessive increase, the committee memorandum says. Over a period of years benefit payments would probably be about doubled as compared with the present act, it further points out. In the sub-

Continued on next left-hand page

MR. SHIPPER

Attention Please!

In the past twenty years, the gross tons per freight train have increased from 1,443 tons to approximately 2,000 tons average, while the speed has increased 60%.

This improvement can be attributed to the initiative of railroad management with the help of better and better equipment, particularly the steam locomotive.

The capacity and efficiency of the modern steam locomotive of today is due largely to the use of superheated steam, waste heat reclamation (feedwater heating) and stoker firing.

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committee's opinion, the margin of safety would remain ample. This latter reference is to the amount of money remaining in the fund in the Treasury.

The subcommittee memorandum further sets out the following "desirable amendments which would simplify administration of the act":

1. Eliminates local labor lodge coverage. The Railroad Retirement Board suggested that employee representatives be removed from the operation of the Act.
2. The registration requirements are simplified.
3. The bill clarifies the definition of "remuneration" or wages paid to employees.
4. It provides for a uniform "benefit year" and simplifies the definition of a "base year."
5. Clarifies the recovery waiver and payment procedures.
6. Makes clear what a "qualified employee" is.
7. Clarifies and simplifies certain disqualifications.
8. Appellate procedure is simplified.
9. The bill simplifies accounting for administrative expenses, without lessening existing controls of the Bureau of the Budget or the General Accounting Office.
10. Gives the Board permanent benefit of the services of a few trained employees now on a temporary basis.
11. It permits the adjustment of the staff by shifting between the departmental and field service and enables personnel to be worked overtime, as the claims load requires, with compensating time off.

The subcommittee dismissed the carriers' bill, S. 3925 by saying that it provides for and is primarily concerned with a reduction in taxes and that the increased benefit payments would "compare unfavorably with the better states and would be too low as compared with wages during employment." Also, the subcommittee said that the tax reductions would preclude further desirable liberalization of benefits, while "the tax formula would tend to reduce taxes during periods of prosperity and raise them during periods of depression—precisely the reverse of what would be desirable, if there is to be any variation in taxes."

Another objection that the subcommittee had to the carriers' bill was that it would eliminate the administrative fund and require dependence on annual appropriations. Unemployment, it said, cannot be forecast in advance and an administrative contingency reserve is an "urgent necessity." The tax rate, it continued, would be so low in many years that the 10 per cent allowed for administrative expenses would be insufficient and the Board would be compelled to request appropriations from the General Fund. In normal years, it concluded, the Board can operate with from six to seven per cent of normal tax receipts—a fairly low figure as compared with the states—but it cannot operate on 10 per cent of one-third the normal tax rate or from two to three per cent of normal tax receipts.

Finds Ore-Dock Workers Are Not Railway Employees

Following the proposed report of its Examiner Claude A. Rice, Division 3 of the Interstate Commerce Commission has found that the work performed by a foreman, assistant foreman, and laborers employed by an independent contractor, and engaged at Superior, Wisc., in the transfer of iron ore from railway cars to lake dock, and from the dock to steamships operated on the Great Lakes, are not railway employees within the meaning of the Railway Labor Act. The proceeding, which was docket as Ex Part No. 72 (Sub-No. 1), was the result of a petition filed February 7, 1939, by the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees.

In another proceeding instituted at the request of the National Mediation Board to determine the status of the Chicago, Aurora & Elgin, Division 3 has found that this carrier does not fall within the exemption proviso of the Railway Labor Act, and is, therefore, subject to that act.

Senate to Get Modified Refrigerator Car Bill

The Senate committee on interstate commerce has voted to report favorably a substitute for the so-called refrigerator-car bill introduced by Senator Shipstead, Farmer-Laborite of Minnesota. The substitute would protect the right of railroads to furnish the cars if they have the proper equipment—if they do not the shippers could furnish cars which were approved by the Interstate Commerce Commission as proper and safe.

A sub-committee of the House committee on interstate commerce has just completed hearings on the refrigerator-car bills pending before that committee. Like the original Shipstead bill these would amend the Interstate Commerce Act to give shippers of fresh meats, packing-house products or dairy products the right to furnish their own refrigerator cars. All such bills were introduced after the Car Service Division on May 5, 1939, issued its pending notice reserving for railroads the right to furnish railroad-owned or railroad-controlled cars for such traffic.

R. C. C. Distribution

The Railroad Credit Corporation will make another liquidating distribution on May 31, according to a May 16 announcement from President E. G. Buckland. The distribution will be of one-half of one per cent of the fund as of April 30, 1940, amounting to $367,556.76. Of this amount $312,567.78 will be paid in cash and $54,988.98 will be credited on carriers' in-

Air Defense at Nobody's Expense?

Captain Eddie Rickenbacker, air line executive and World War hero, has put forward in a syndicated newspaper article a scheme to arm the U. S. A. aeronautically without costing the taxpayers anything. His idea is to turn over to the air lines the handling of all first class mail, for distances over 100 miles.

To handle all this mail would require a huge expansion in planes, plane-manufacturing facilities and personnel, which, Captain Rickenbacker suggests, could be shifted to military uses should the necessity arise.

The way he figures that this scheme wouldn't cost anything is that the air lines would be glad to handle this letter mail at 3 cents per ounce. But where his figures are balled up is that, while Uncle Sam *collects* 3 cents per letter, he *pays* the railroads only ⅙ cent per piece for handling letter mail. The 2⅚ cents per letter, over and above payment to the railroads, goes to pay the salaries of letter carriers and the operating expenses and overhead of the Post Office. Captain Rickenbacker has been thrown off the scent, probably, by the fact that the government pays the air lines more than 7½ cents per piece of air mail—and he has assumed that Uncle Sam is as generous with the railroads as he is with the air lines, which he isn't.

For hauling 11,000 million pieces of letter mail in 1939, the Post Office paid the railroads $20,450,000. Captain Rickenbacker is proposing that the Post Office pay the air lines approximately $330,000,000 for service it now gets for about $310,000,000 less money.

Putting the Post Office 310 million dollars *per year* deeper in the red than it is doesn't look much like getting air defense for nothing. And who will haul the mails if air transport goes off to war? Are the railroads to be a facility used only in war time and, if so, what are they going to live on between wars?

Air defense is one thing and economical transportation is another. We need both, but why sacrifice the latter to achieve the former? The air lines are already taking a good big ride at the expense of the Post Office ($16,625,000 last year for handling 221 million pieces of mail—or 37 times the rate paid to the railroads; 80 per cent as much as the railroads were paid for handling 50 times as much letter mail as the air lines handled).

Doesn't Uncle Sam need railroads, too, for national defense? And if they are to be available in case of war, they cannot be deprived arbitrarily of badly-needed revenues; especially for traffic to which they have a legitimate economic claim.

Continued on next left-hand page

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debtedness to the Corporation. This will bring the total amount distributed to $58,073,998.25, or 79 per cent of the original fund contributed by carriers participating in the Marshalling and Distributing Plan, 1931. Of this total, $30,591,894.06 will have been returned in cash and $27,482,104.19 in credits.

April Operating Revenues 12.1 Per Cent Above 1939

Preliminary reports from 88 Class I railroads, representing 83 per cent of total operating revenues, made public today by the Association of American Railroads, show that those roads, in April, had estimated operating revenues amounting to $262,521,848 compared with $234,186,711 in the same month of 1939, and $370,924,278 in the same month of 1930. The April gross was 12.1 per cent above that for April, 1939, but 29.2 per cent below April, 1930.

Freight revenues of the 88 Class I roads in April, amounted to $216,309,559 compared with $185,680,740 in April, 1939, and $286,345,709 in April, 1930—16.5 per cent above the former, but 24.5 per cent below the same month in 1930. Passenger revenues totaled $24,600,479 compared with $26,617,304 in April, 1939, and $50,004,359 in April, 1930—7.6 per cent below the former, and 50.8 per cent below 1930.

February Bus Revenues 10.9 Per Cent Above 1939

Class I motor carriers of passengers reported February revenues of $7,223,884, as compared with $6,514,947 in February, 1939, an increase of 10.9 per cent, according to the latest compilation prepared by the Interstate Commerce Commission's Bureau of Statistics from 143 monthly reports representing 144 bus operators. Passengers carried increased 19.9 per cent, from 8,858,884 to 10,622,145.

	Passenger Revenue		Passengers Carried	
	February, 1940	February, 1939	February, 1940	February, 1939
New England Region	$337,663	$332,970	874,245	830,916
Middle Atlantic Region	1,073,219	975,524	2,429,800	2,094,669
Central Region	1,282,355	1,117,699	2,180,397	1,477,937
Southern Region	1,791,217	1,583,385	2,186,694	1,809,478
Northwestern Region	274,814	233,065	264,748	245,230
Mid-Western Region	558,082	501,505	471,906	435,737
Southwestern Region	887,443	856,661	975,808	913,204
Rocky Mountain Region	75,852	70,132	68,451	64,891
Pacific Region	943,239	844,006	1,170,096	986,822

The breakdown by regions of the bus revenue and traffic figures, which exclude data on charter or special party service, is given in the accompanying table.

C. N. R. Union-Management Group Reviews Year

The fourteenth annual meeting of the Canadian National's Union-Management Co-operative movement, Mechanical section, was concluded in Montreal, Que., on May 17. The meeting reviewed the work of the co-operative committees for 1939, the reports revealing that 751 co-operative committee meetings were held at points where major shops are located. At these meetings, 1,447 items were brought up, of which 1,046 were accepted, 126 dropped and 275 pending. There was an increase of 15 per cent in the number of suggestions dealt with during the year as compared with 1938. Records show that since the movement began 25,000 subjects have been brought up, of which 84 per cent have been accepted. The subjects covered included first aid and accident prevention, fire prevention, securing traffic for the railway, apprentice training, stabilization of employment, improving conditions in shops, development of new devices, care of tools and machinery, economy, storage and handling of materials, shop methods and practices and improvements and maintenance of locomotives and cars.

The meeting was held under the chairmanship of A. J. Hills, chief of personnel, and was addressed by S. J. Hungerford, president; Vice-Presidents R. C. Vaughan and N. B. Walton; John Roberts, chief of motive power & car equipment; President R. J. Tallon of Division No. 4 of railway employees, and J. Corbett, president, System Federation No. 11 of American Federation of Labor. Dr. S. H. Slichter, professor of business economics, Harvard University, who is studying industrial relations in large corporations, was an interested observer.

General Rate Investigation Urged in Canada

A general review of Canada's railway freight rate structure on a Dominion-wide scale has been recommended by the Royal Commission on Dominion-Provincial Relations in its report to the Canadian government after a brief review of complaints placed before it. The report was tabled last week in the House at Ottawa by Premier King.

Such a review would permit the various governments to present their claims to a body qualified to make appropriate awards and make it possible to deal with rates for water-borne traffic. The commission considered the present opportune for such review because of changed conditions "due to the increased range and effectiveness of alternative means of transportation and the increasing signs of a revival of regional questioning as to the justice of the existing structure."

While Ontario, for example, contended before the commission that low Western grain rates were a burden on Eastern Canada, the commission stated that the record, which it reviewed, left undecided the question of the profitability or otherwise of the grain rates. A definite finding on this point would be a contribution to the process of adjustment, it added.

In adjustment of rates to meet revenue needs of the railways and the competition of other forms of transportation, "apparent inequalities and injustices have arisen," the commission said.

As to the equalization of freight rates, it reported that its research staff conducted studies from which it concluded that "despite very special difficulties due to conditions of geography and terrain, the tendency of rate making has been and still is to lessen the regional differences and, what is also very important, to keep for Canada a position of relatively low freight rates."

Dr. W. A. Mackintosh, one of the commission's economic advisers, was quoted as believing that variations in regional freight rates cannot be entirely ironed out unless one jurisdiction is given control of all alternative forms of transportation; raising rates on basic commodities and rates generally in areas of greatest competition; meeting part of railway costs by taxation.

Freight Car Loading

Carloading reports for the week ended Saturday, May 18, were not available at the time this issue went to press.

As reported in last week's issue, loading of revenue freight for the week ended May 11 totaled 680,657 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For Week Ended Saturday, May 11

Districts	1940	1939	1938
Eastern	143,762	130,545	118,191
Allegheny	142,686	100,283	97,382
Pocahontas	48,882	12,608	33,311
Southern	100,127	84,745	85,389
Northwestern	103,673	86,218	71,179
Central Western	96,518	96,882	91,766
Southwestern	45,009	43,363	44,590
Total Western Districts	245,200	226,463	207,535
Total All Roads	680,657	554,644	541,808
Commodities			
Grain and grain products	32,226	34,367	32,226
Live stock	11,493	12,783	12,166
Coal	118,382	42,499	81,404
Coke	8,008	4,455	4,073
Forest products	33,351	30,589	26,354
Ore	51,572	24,928	12,971
Merchandise l.c.l.	149,047	152,168	148,845
Miscellaneous	276,578	252,855	223,769
May 11	680,657	554,644	541,808
May 4	665,510	572,025	536,149
April 27	644,520	585,190	543,089
April 20	628,342	557,867	523,748
April 13	618,810	547,179	537,585
Cumulative Total, 19 Weeks	12,005,370	10,900,108	10,363,109

In Canada.—Carloadings for the week ended May 11 totaled 52,766, as compared with 51,257 in the previous week and 51,432 in the corresponding week of 1939, according to the weekly summary by the Dominion Bureau of Statistics.

Total for Canada:	Total Cars Loaded	Total Cars Rec'd from Connections
May 11, 1940	52,766	25,657
May 4, 1940	51,257	25,573
Apr. 27, 1940	50,636	25,255
May 13, 1939	51,432	22,514
Cumulative Totals for Canada:		
May 11, 1940	910,320	467,242
May 13, 1939	805,830	404,105
May 14, 1938	844,174	407,843

Four-Months Car Installations Largest Since 1930

Class I railroads in the first four months of 1940 put in service 27,809 new freight cars, the largest number installed in any corresponding period since 1930, accord-

ing to the Association of American Railroads. The number installed in the first four months this year was an increase of 20,992 compared with the same period in 1939, and an increase of 22,507 compared with the corresponding period in 1938.

New steam locomotives put in service in the first four months of 1940, totaled 27 compared with nine in the same period in 1939, and 94 in the same period in 1938. New electric and Diesel-electric locomotives installed in the first four months' period this year totaled 88 compared with 70 in the same period last year, and 49 in the same period two years ago.

Class I roads on May 1, had 17,460 new freight cars on order, compared with 6,391 on the same day last year, and 4,867 on the same day in 1938. New steam locomotives on order on May 1, totaled 54 compared with 61 on May 1, 1939, and 61 on May 1, 1938; new electric and Diesel-electric locomotives on order on May 1, this year totaled 41 compared with 25 last year, and 10 two years ago.

Freight cars and locomotives leased or otherwise acquired are not included in the above figures.

High School Students Visit C. N. R. Windsor Terminal

The Grand Trunk-Canadian National played host to about 100 students of the East Detroit High School several weeks ago. The visitors inspected various types of equipment in daily use at Detroit, Mich., and then crossed the river to make an inspection trip of the Windsor Terminal under the personal supervision of J. A. Clancy, general manager, Grand Trunk Western. The young people were given opportunity to look over locomotive 6400 which hauled the Royal train last summer and tried out one of the new C. N. R. dining cars.

Inquiry brought out that only 40 out of the entire party of 100 had ever seen the interior of a railroad train before, only 18 had ever slept in a Pullman car, and 12 had partaken of a meal in a railroad diner.

Gulf Transport Gets Bus Routes

The Interstate Commerce Commission, Division 5, has granted a certificate to the Gulf Transport Company, affiliate of the Gulf, Mobile & Northern, for common-carrier bus operations over five routes—four in Mississippi and one between Laurel, Miss. and Mobile, Ala. The decision is in No. MC-50655 (Sub-No. 3).

Union Presses "Make Work" Bill

(*Continued from page 950*)

conductors on the integrity and ability of the porters in charge of cars. These men, he declared, were well known to the company for their ability and were selected only after long periods of service as porters. He also asserted that he had yet to hear of a single instance where a porter had failed to protect the interests of the passengers in his charge.

During the testimony some of the witnesses for the brotherhood had testified that the porters were afraid of dead people and were wont to run out and leave a car in which a passenger had died. In commenting on this accusation, Mr. Carry declared that he could well understand the aversion of porters for dead persons, as he had had considerable experience with dead people and he dreaded them as much as anyone.

The consensus of railroad operating men was that if the bill became law many Pullman cars would have to be taken off of light runs as the lines are barely paying their way now, and some are losing money. These are run only for public convenience and their operation could not be justified if the salary of a Pullman conductor had to be added to the cost of operation. The railroad operating men who appeared in opposition to the measure included J. M. Symes, general manager of the Western region of the Pennsylvania; E. E. Pierce, general passenger agent of the New York Central; C. H. Buford, vice president in charge of the operating and maintenance department of the Association of American Railroads; J. C. Caviston, secretary of the operating section of the A. A. R.; and J. M. Hood, president of the American Short Line Railroad Association, who also objected to the bill on the ground that it invaded the field of managerial discretion.

Another witness for the Pullman Company was Bessie D. Chantler, a national associate of the Travelers' Aid Association of New York, who told the subcommittee that her organization, which handles many thousands of travelers a year on the railroads, had found the Pullman service to be of the highest quality. Moreover, she said, until she heard of this bill, she had never given the question of porters in charge of cars any thought, feeling that she received just as good service from them as from Pullman conductors.

In his summation, Mr. Hay denied that he had made an attack on the porters, praising them for their ability and integrity. He accused the Pullman Company of fostering the use of liquor on trains, saying that he had heard that the company was doing everything possible to increase the sale of liquor in their cars. "We now have saloons on the rails," he observed, "and we'll probably soon be having them in the air." This accusation, Mr. Carry promptly denied.

Mr. Hay also offered some free advice to the Pennsylvania regarding their passenger service, telling Mr. Symes, who was sitting across the table, that he might well try some new ideas in courtesy on his road. "You represent the employees who are giving this poor service, don't you?", shot back the Pennsylvania official. "Why don't you take it up with the labor chiefs who have supervision of these men if you want better service?"

Senator Minton observed at the close of the hearing that no one had introduced evidence to show how much this bill would cost, but he felt it would not be very burdensome on the Pullman Company in view of the fact that it was still paying dividends. Mr. Carry asked and was granted leave to file with the committee more specific information as to how much the bill would cost individual railroads. He said that such information was not introduced because of the difficulty of getting it from each railroad which operated Pullman service.

Senator Minton also said that he believed it would be best to negotiate this matter between the company and the employees rather than enacting it into law. Such enactment, he thought, might easily result in certain cases which would be very burdensome on the company.

The Pullman Company asked leave to

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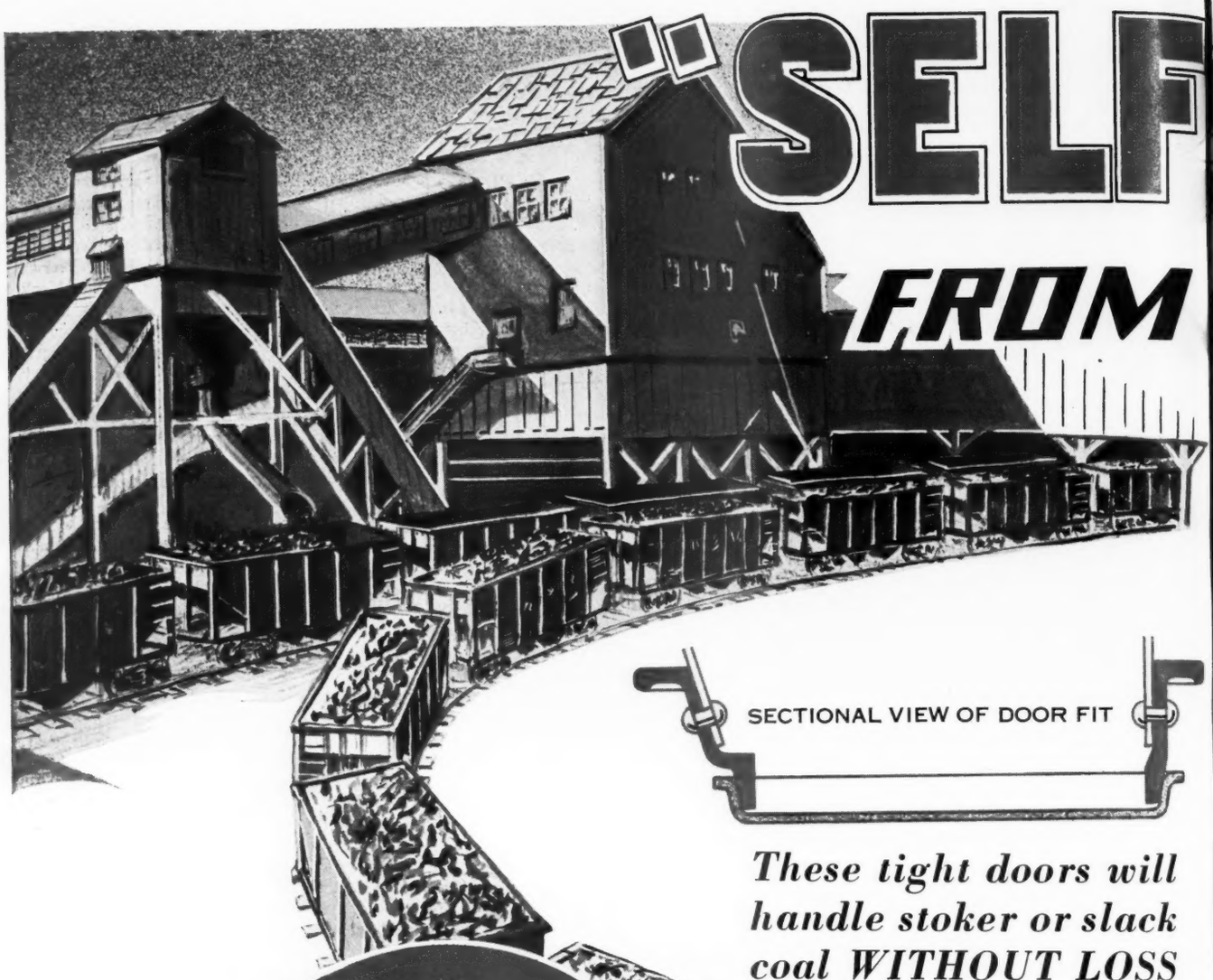
High School Guests of the Canadian National Inspected Locomotive 6400 — Which Hauled the Royal Train—at a Recent Inspection Trip at Windsor (Ont.) Terminal



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MINE TO USER

Transportation without loss means

***Lower* cost per ton**

APPLIANCE COMPANY
OHIO

file a short brief, but Chairman Minton did not feel that such was necessary and denied the request.

"All-Freight" to South O. K.

(*Continued from page 951*)

in undue preference to Memphis, and undue prejudice to other shipping points; and (2) that the present and proposed rates of both rail and motor carriers, constructed on the bases of 75, 60 and 46 per cent of first-class rates for minimums of 12,000, 25,000 and 40,000 pounds are unlawful to the extent indicated in Middle Atlantic States M. C. Conf. v. C. R. Co. of N. J., 232 I. C. C. 381, and it (the commission) should affirm the findings in that proceeding without prejudice to the filing of new schedules conforming to the views expressed herein."

Reviewing the evidence, Examiner Way points out how the all-freight rate or all-commodity rate is one of the railroad experiments to recapture traffic lost to competitors. He noted that when the rates to Birmingham were first proposed the Southern roads, other than the publishing lines, opposed their establishment; but all the Southern carriers represented at the hearing nevertheless urged the continuance of the rates. Next it is stated that "by far the greater proportion of the all-commodity traffic is for the forwarding companies, mail order and general merchandise houses." However, the all-commodity rates "are generally higher than other rates on straight carloads subject to the same or higher minima, and it is apparent that they would have but little effect upon the rates for such traffic." With respect to the effect upon the revenues of the rail carriers, the proposed report found that "the following facts appear to be established of record: (1) All-commodity traffic loads heavier than less-than-carload freight, which results in less switching and road hauling . . . (2) the freight is loaded and unloaded by the consignors and consignees, eliminating the cost to the carriers of the pick-up, delivery and platform handling and reducing the cost of accounting and checking." Moreover, the railroads consider the all-commodity rates "to be fully compensatory."

Dealing with the operations of the forwarders, the examiner says that "in the past and apparently now certain concessions are made to shippers who provide large shipments with regularity, and whose traffic might be used by competitive freight forwarders as the nucleus for a new service and through that means lowering the rates generally." However, he adds, "it is stated that the rates are becoming standardized and such concessions have decreased." The service of the forwarding companies up to 400 miles is equal to that of express, the proposed report goes on; over 400 miles and up to 900 miles it is from one-half to one day slower. On longer hauls "it may be three to four days slower than by express; where through cars are operated the transit time by forwarders is the same as the less-than-carload rail service. Where no through package cars are operated the forwarders' service is from one to two days faster than by rail."

Another large user of the all-commodity rates is Sears Roebuck & Company which shipped into the South by truck prior to the establishment of such rates. It now ships by rail, and "is not so much concerned with the measure of the rates as with the mixing rules, which are necessary in the conduct of its business." If the all-commodity rates are canceled, Sears' witness said that company "will be forced to establish its own truck lines and haul the freight Southbound and bring back textiles, of which it is one of the largest distributors in the United States." Here the examiner follows through to note the position of the railroads that "it is their duty to meet the methods of doing business used by both large and small shippers." The position of representatives of other shipping interests was summed up in the aforementioned statement of their contention that "these rates have become an integral part of the transportation system and are indispensable."

Equipment and Supplies

LOCOMOTIVES

THE TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS has ordered two 1,000-hp. and eight 660-hp. Diesel electric switching locomotives, six from the Electro-Motive Corporation, two from the Baldwin Locomotive Works and two from the American Locomotive Company. As reported in the *Railway Age* of April 27, directors approved the purchase of this equipment on April 22.

FREIGHT CARS

THE TENNESSEE COAL, IRON & RAILROAD CO. has ordered 16 air dump cars of 70 tons' capacity, from the Pressed Steel Car Company. This company was reported in the *Railway Age* of March 30, page 609, as contemplating the purchase of this equipment.

PASSENGER CARS

THE CANADIAN PACIFIC is asking for prices on the construction of the frames for 25 passenger coaches, on which interior work will be carried out in the railroad company's own shops at Montreal, Quebec. The cars are to be air conditioned and have an over-all length of 83 ft. 10½ in. between the coupler buckles and will have a clear inside length of 77 ft. 3½ in. The inside layout provides toilet rooms and drinking fountains at each end of the car and the passenger space will be divided into two compartments, a smoking space seating 16, divided by a glass partition from the main portion of the car which provides seats for 56 passengers.

Supply Trade

C. B. Boyne, manager of stainless bar and wire sales of the **Allegheny Ludlum Steel Corporation,** Pittsburgh, Pa., has been appointed manager of stainless sales, with headquarters at Pittsburgh.

J. L. McCaffrey, director of domestic and Canadian sales of the **International Harvester Company,** Chicago, has been promoted to vice-president in charge of domestic and Canadian sales to succeed **Charles R. Morrison,** retired.

C. R. Hale, assistant purchasing agent since 1936 of the **Air Reduction Company,** has been appointed purchasing agent of the company and its subsidiary and affiliated concerns, succeeding **H. M. Daggett,** who has retired.

OBITUARY

Byron E. Blaisdell of the transportation department staff of Johns-Manville, New York, died suddenly of a heart attack on May 15 at Clinton, Iowa, while on a business trip, at the age of 41. Mr. Blaisdell joined Johns-Manville as Western sales manager of the automotive department and was later transferred to the transportation department as staff manager in charge of street railway, motor bus and aviation activities. With the amalgamation of the transportation and automotive departments Mr. Blaisdell was made staff manager, automotive.

Construction

BALTIMORE & OHIO CHICAGO TERMINAL.—Work is in progress on the renewal of an interlocking plant at 49th street (Chicago) which will cost approximately $45,000. The work consists of the renewal of the plant, the tower of which was destroyed by fire last year, and modernization as required by the I. C. C. Signal Inspection Act. As much of the old mechanical interlocking as possible will be re-used.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract amounting to $116,772 has been awarded Guy H. James, Norman, Okla., for the construction of a concrete and steel overpass 1121 ft. long and approaches on state highway No. 167 over the Rock Island tracks on Arch street in Little Rock, Ark. The structure will consist of 50-ft. I-beam spans, with occasional 25-ft. tower spans, supported on two-column reinforced concrete bents and will provide a clear roadway width of 26 ft. with two 24-in. walkways. Retaining wall approaches will be constructed at each end of the bridge.

NEW YORK, NEW HAVEN & HARTFORD.—A contract has been awarded to the George F. Collins Company, Inc., New York, for the construction of a concrete freight platform with covershed, also a concrete driveway, etc., at Harlem River, N. Y., at a cost of about $40,000.

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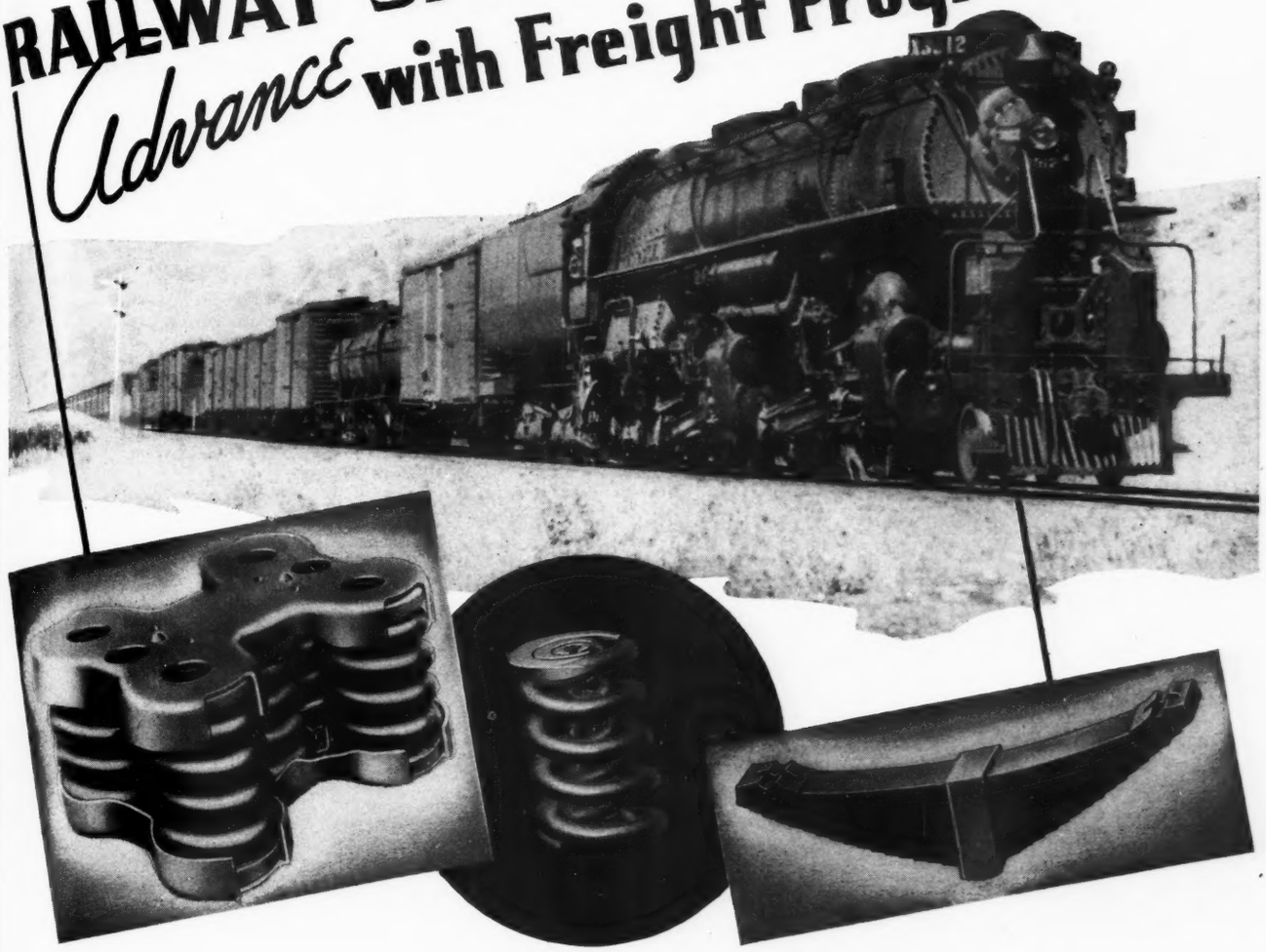
RAILWAY SPRINGS *Advance* with Freight Progress



HIGHER speeds, and heavier cars and locomotives require improved springs to prevent excessive wear and tear on track and rolling stock.

"Railway" Quality Springs manufactured under precise methods, produce smooth riding freight equipment, a forward step in low cost mass transporation.

AMERICAN LOCOMOTIVE COMPANY

Railway Steel Spring Division

30 CHURCH STREET, NEW YORK, N. Y.

Financial

ATLANTIC COAST LINE.—*Abandonment.* This company has been granted permission by Division 4 of the Interstate Commerce Commission to abandon its so-called Beach Grove branch extending from Drivers, Va., northerly to Beach Grove, 1.5 miles.

CHESAPEAKE & OHIO.—*Annual Report.*—The 1939 annual report of this road shows net income of $27,342,711 after interest and other charges, an increase of $6,569,878 as compared with net income in 1938. Selected items from the income account follow:

	1939	Increase or Decrease Compared with 1938
RAILWAY OPERATING REVENUES	$118,722,054	+$12,345,571
Maintenance of way	11,022,218	+200,449
Maintenance of equipment*	23,387,375	+2,764,736
Transportation	28,425,588	+1,352,531
TOTAL OPERATING EXPENSES	68,859,621	+4,413,601
Operating ratio	58.00	−2.58
NET REVENUE FROM OPERATIONS	49,862,432	+7,931,970
Railway tax accruals	13,296,194	+699,736
Railway operating income	36,566,237	+7,232,233
Equipment rents—Net	1,023,976	+116,962
Joint facility rents—Net	1,236,076	+21,630
NET RAILWAY OPERATING INCOME	36,354,138	+7,370,826
Other income	569,807	−342,565
TOTAL INCOME	37,005,056	+7,052,506
Rent for leased roads and equipment	49,446	+2,806
Interest on debt	9,469,988	+365,023
NET INCOME	$27,342,711	+$6,659,878

* Includes depreciation.

CHICAGO & NORTH WESTERN.—*Abandonment and Trackage Rights.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to (1) abandon the two parts of a branch line (a) from Carroll, Iowa, to Halbur, 7.6 miles, and (b) from Halbur, Iowa, to Manning, 6.7 miles; and (2) to operate under trackage rights over the parallel main line of the Chicago Great Western between Carroll, Iowa, and Manning, 17 miles.

CHICAGO, BURLINGTON & QUINCY.—*Annual Report.*—The 1939 annual report of this road shows net income of $3,661,339 after interest and other charges, an increase of $19,577 as compared with net income in 1938. Selected items from the income account follow:

	1939	Increase or Decrease Compared with 1938
RAILWAY OPERATING REVENUES	$96,131,794	+$3,061,658
Maintenance of way	12,844,765	+1,190,563
Maintenance of equipment	17,381,993	+1,972,260
Transportation	34,256,995	+636,988
TOTAL OPERATING EXPENSES	70,885,895	+3,798,675
Operating ratio	73.74	+1.66
NET REVENUE FROM OPERATIONS	25,245,898	−737,017
Railway tax accruals	8,616,802	−444,707
Railway operating income	16,629,096	−292,310
Hire of Equipment—Net Dr.	2,227,271	−270,712
Joint facility rents—Net Dr.	2,131,373	+115,342
NET RAILWAY OPERATING INCOME	12,270,451	−136,941
Other income	1,134,965	+39,149
TOTAL INCOME	13,405,416	−97,792
Rent for leased roads and equipment	85,228	−4,506
Interest on funded debt	9,376,771	−35,886
TOTAL FIXED CHARGES	9,645,465	−118,523
NET INCOME	$3,661,339	+$19,577

COLORADO & SOUTHERN.—*Annual Report.*—The 1939 annual report of this road shows net deficit of $880,738 after interest and other charges, a decrease of $100,316 as compared with net deficit in 1938. Selected items from the income account follow:

	1939	Increase or Decrease Compared with 1938
RAILWAY OPERATING REVENUES	$13,049,361	−$600,696
Maintenance of way	1,361,007	−44,990
Maintenance of equipment	2,225,002	−181,961
Transportation	4,797,581	−339,483
TOTAL OPERATING EXPENSES	9,498,507	−595,126
Operating ratio	72.79	−1.16
NET REVENUE FROM OPERATIONS	3,550,854	−5,570
Railway tax accruals	1,443,339	−3,184
Railway operating income	2,107,515	−2,386
Hire of Equipment—Net Dr.	409,209	−155,492
Joint facility rents—Net Dr.	325,873	+42,354
NET RAILWAY OPERATING INCOME	1,372,432	+110,752
Other income	143,202	−388
TOTAL INCOME	1,515,634	+110,363
Rent for leased roads	4,066	−14,251
Interest on funded debt	2,324,769	+22,828
TOTAL FIXED CHARGES	2,383,172	+13,357
NET DEFICIT	$880,738	−$100,316

DELAWARE, LACKAWANNA & WESTERN.—*Warehouse Lease.*—A large freight warehouse located on the tracks of this road at Grove street, Jersey City, N. J., operated by the Lackawanna Terminal Warehouses, Inc., since 1929 has been leased to the Lackawanna Warehouse Company, Inc., effective June 1. The office of the new company will be in the warehouse building.

KANSAS CITY SOUTHERN.—*New Director.*—Paul V. Shields has been elected a director to succeed John H. Wiles of Kansas City, Mo., who resigned to assume a directorship with the Louisiana & Arkansas (affiliated with the K. C. S.).

MISSOURI & ARKANSAS.—*Bonds.*—This company has asked the Interstate Commerce Commission for authority to issue $500,000 of first mortgage 25-year four per cent bonds, of which $230,000 would be either sold and the proceeds used to reimburse the treasury or pledged for notes at a ratio of 1½ to 1, while the remaining $270,000 would be issued and kept in the treasury. At the same time the company asked permission to withdraw its pending application to issue 3,500 shares of no-par common stock and to surrender and cancel its now outstanding capital stock by exchange of the stock and first mortgage bonds aggregating $280,000.

MISSOURI PACIFIC.—*Abandonment.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to abandon a portion of the so-called Grand Falls branch extending southwardly from the Joplin Water Works to the end of the line, 1.1 miles, all in Newton County, Mo.

NEW ORLEANS & NORTHEASTERN.—*Annual Report.*—The 1939 annual report of this road shows net income of $133,592 after interest and other charges, an increase of $87,548 as compared with net income in 1938. Selected items from the income account follow:

	1939	Increase or Decrease Compared with 1938
RAILWAY OPERATING REVENUES	$3,107,907	+$59,266
Maintenance of way	392,218	+1,645
Maintenance of equipment	413,290	−11,539
Transportation	902,588	−40,816
TOTAL OPERATING EXPENSES	1,917,726	−61,535
Operating ratio	61.70	−3.22
NET REVENUE FROM OPERATIONS	1,190,181	+120,802
Taxes	408,074	+43,688
Equipment rents	403,407	−11,647
Joint facility rents	125,013	−146
NET RAILWAY OPERATING INCOME	503,712	+88,614
Other income	25,706	−1,182
TOTAL GROSS INCOME	529,419	+87,433
Interest on funded debt	392,325	.....
TOTAL DEDUCTIONS FROM GROSS INCOME	395,827	−115
NET INCOME	$133,592	+$87,548

NEW YORK CENTRAL.—*Equipment Trust Certificates.*—Division 4 of the Interstate Commerce Commission has authorized this road to issue $10,400,000 of two per cent equipment trust certificates to be sold at 101.0549 (approximately a 1.795 per cent basis) to Gregory & Sons, Incorporated, who submitted the highest of six bids received after invitations were sent to 156 firms and institutions. The certificates will mature in 10 equal annual installments of $1,040,000 on June 1 of each year 1941 to 1950.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Annual Report.*—The 1939 annual report of this company shows net income of $618,667 after interest and other charges, an increase of $476,372 as compared with net income in 1938. Selected items from the income account follow:

	1939	Increase or Decrease Compared with 1938
Average Mileage Operated	1,110.79	−4.72
RAILWAY OPERATING REVENUES	$14,827,811	+$1,168,270
Maintenance of way	1,650,927	+204,507
Maintenance of equipment	2,835,644	+283,262
Transportation	5,718,986	+224,105

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Total Operating Expenses	11,648,855	+700,979
Operating ratio	78.56	−1.59
Net Revenue from Operations	3,178,956	+467,291
Railway tax accruals	934,296	+12,437
Railway operating income	2,244,659	+454,854
Equipment rents—Dr.	434,532	−50,342
Joint facility rents	172,526	−4,478
Net Railway Operating Income	1,982,653	+500,718
Other income	191,516	−23,253
Gross Income	2,174,169	+477,465
Rent for leased roads	804,652	−424
Interest on funded debt	688,590	−1,260
Total Deductions from Gross Income	1,555,502	+1,093
Net Income	$618,667	+$476,372

Pittsburgh & Lake Erie.—*Annual Report.*—The 1939 annual report of this road shows net income of $3,590,248 after interest and other charges, an increase of $1,891,727 as compared with net income in 1938. Selected items from the income account follow:

	1939	Increase or Decrease Compared with 1938
Railway Operating Revenues	$19,250,994	+$5,071,927
Total Operating Expenses	15,772,323	+2,972,670
Operating ratio	81.93	−8.34
Net Revenue from Operations	3,478,671	+2,099,256
Railway tax accruals	2,042,680	+472,112
Railway operating income	1,435,990	+1,627,143
Equipment rents—Net Cr.	2,332,935	+361,667
Joint facility rents—Net Cr.	37,791	+14,740
Net Railway Operating Income	3,806,716	+2,003,550
Other income	509,685	+258,169
Total Income	4,316,402	+2,261,719
Rent for leased roads and equipment	38,906	−1,972
Interest on funded debt	722	−1,144
Total Fixed Charges	39,629	−3,116
Net Income	$3,590,248	+$1,891,727

Southern.—*R. F. C. Loan.*—Division 4 of the Interstate Commerce Commission has approved the release by the Reconstruction Finance Corporation of $7,839,000 of Mobile & Ohio general mortgage four per cent bonds, pledged for loans previously approved, upon the condition that this company curtails the principal of its loans from the R. F. C. by the amount of $7,295,000 plus interest on that amount at two per cent per annum from September 1, 1938, to the date of repayment. This authority was necessary in order that this company could sell the bonds to the Gulf, Mobile & Northern in connection with the merger of the M. & O. and the G. M. & N. into a new company, the Gulf, Mobile & Northern.

Wabash.—*Equipment Trust Certificates and R. F. C. Financing.*—Division 4 of the Interstate Commerce Commission has approved a plan whereby this company would issue and sell to the Reconstruction Finance Corporation $9,150,000 of its 2½ per cent equipment trust certificates, maturing in 15 consecutive semi-annual equal installments beginning October 1, 1940, and thereafter each April 1 and October 1, to and including October 1, 1947. This application is an amendment to an application which was approved by the commission and reviewed in the *Railway Age* of December 30, 1939, page 1015, in which this company was authorized to sell to the R. F. C. $9,300,000 of 2½ per cent equipment trust certificates. The new authorization would reduce the loan by $150,000.

St. Louis-San Francisco.—*Annual Report.*—The 1939 annual report for this company shows net deficit of $8,805,922 after interest and other obligations, a decrease of $2,727,028 as compared with net deficit in 1938. Selected items from the consolidated income account follow:

	1939	Increase or Decrease Compared with 1938
Average Mileage Operated	5,214.93	−49.71
Railway Operating Revenues	$47,716,097	+$2,608,554
Maintenance of way	7,212,699	−108,705
Maintenance of equipment	8,074,235	+355,814
Transportation	17,922,032	−51,329
Total Operating Expenses	40,023,072	+217,879
Operating ratio	83.88	−4.37
Net Revenue from Operations	7,693,024	+2,390,674
Railway tax accruals	3,909,474	+8,064
Hire of equipment—net	276,277,	−311,478
Joint facility rents—net	224,303	−6,265
Net Railway Operating Income	3,835,524	+2,700,353
Other income	159,184	−18,502
Gross Income	3,994,708	+2,681,851
Rentals	66,708	+11,090
Total Deductions from Gross Income	92,498	+21,528
Balance available for interest	3,902,210	+2,660,322
Interest on fixed charge obligations	12,708,132	−66,705
Deficit	$8,805,922	−$2,727,028

Wheeling & Lake Erie.—*Annual Report.*—The 1939 annual report of this company shows net income of $3,578,282 after interest and other charges, an increase of $1,884,355 as compared with net income in 1938. Selected items from the income account follow:

	1939	Increase or Decrease Compared with 1938
Railway Operating Revenues	$14,919,230	+$3,937,500
Total Operating Expenses	10,136,644	+2,048,795
Operating ratio	67.94	−5.71
Net Revenue from Operations	4,782,585	+1,888,705
Railway tax accruals	1,578,059	+280,853
Railway operating income	3,204,526	+1,607,853
Net rents—Cr.	879,234	+291,348
Net Railway Operating Income	4,083,760	+1,899,200
Other income	143,134	−3,030
Total Income	4,226,894	+1,896,169
Interest on funded debt	619,747	−2,280
Total Fixed Charges	626,436	−2,882
Net Income	$3,578,282	+$1,884,355

Railway Officers

EXECUTIVE

J. N. Brand, assistant vice-president of the Atlantic Coast Line, with headquarters at Wilmington, N. C., will retire at his own request, effective June 30.

Richard Edward Kendrick, whose appointment as assistant to president of the Napierville Junction, with headquarters at Montreal, Que., was announced in the *Railway Age* of May 11, was born on August 29, 1894, at Montreal. He attended Riverside & Commercial & Technical High School, and entered railroad service in June, 1906, with the Grand Trunk (now Canadian National). On May 15, 1911, he became a stenographer in the service of the Canadian Northern, with headquarters at Montreal, which position he held until January 16, 1913, when he became stenographer on the Canadian Pacific at Montreal. On February 15, 1913, Mr. Kendrick joined the Napierville Junction as chief clerk, also at Montreal, and on October 24, 1929, he was appointed secretary, retaining his duties as chief clerk. In addition to his duties as assistant to president, Mr. Kendrick will continue to serve as secretary of the road.

Leonard B. Allen, whose promotion to assistant to the president of the Chesapeake & Ohio Lines, including the Nickel Plate and the Pere Marquette, with headquarters at Cleveland, Ohio, was announced

Greystone Studios, Inc.
Leonard B. Allen

in the *Railway Age* of May 11, was born at Lexington, Ky., on April 19, 1879, and was graduated in civil engineering from Kentucky State University in 1899. He entered railway service in that year as a rodman on the Southern, and in August, 1899, he went with the C. & O., as a levelman on the location of the Big Sandy division. He served on location and construction work until January 1, 1904, when he was promoted to assistant in the office of the engineer maintenance of way at

Richmond, Va., and a year later he was advanced to division engineer of the Kentucky division, with headquarters at Ashland, Ky. Mr. Allen was promoted to engineer maintenance of way of the Kentucky general division, with headquarters at Covington, Ky., on May 1, 1910, and on January 1, 1914, he was further advanced to assistant chief engineer, with headquarters at Richmond. One month later he was appointed superintendent of the Huntington and Big Sandy divisions, with headquarters at Huntington, W. Va., and on July 1, 1916, he was promoted to general superintendent of the Western general division, with the same headquarters. On January 29, 1918, Mr. Allen was advanced to superintendent of maintenance of way for the entire system, with headquarters as before at Huntington, and in October, 1926, he was promoted to assistant to the vice-president, with headquarters at Richmond. Early in 1933, Mr. Allen was appointed assistant to the executive vice-president of the C. & O., and the Nickel Plate, and later of the Pere Marquette, with headquarters at Cleveland, the position he held until his recent promotion.

OPERATING

Harold R. Tinkelpaugh, assistant contract supervisor of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been appointed special representative to the chief operating officer for such duties as may be assigned, with the same headquarters.

J. M. Guild, who since 1935 has been superintendent or assistant superintendent of the Colorado division of the Union Pacific, with headquarters at Denver, Colo., has been appointed special representative to the assistant vice-president of operation, at Omaha, Neb.

D. R. Hickok, manager of mail and express traffic of the Chicago & North Western, has been appointed manager of mail, baggage and express traffic, and **W. S. Gregory,** general baggage agent, has been appointed assistant manager of mail, baggage and express traffic, with headquarters as before at Chicago.

C. M. Ryder, assistant trainmaster of the Chesapeake & Ohio, has been appointed trainmaster, with headquarters at Columbus, Ohio, succeeding **W. M. Deeds,** deceased. **W. S. Perry,** assistant trainmaster, has been appointed trainmaster, with headquarters at Huntington, W. Va., succeeding **C. S. Louden,** deceased.

M. E. Pangle, formerly assistant to the president of the Chicago & North Western, whose retirement on May 1, as director of personnel, with headquarters at Chicago, was announced in the *Railway Age* of May 11, was born at Geneva, Neb., in 1875, and entered the service of the Chicago & North Western in 1896 as a freight brakeman at Chadron, Neb. He served successively as a conductor and trainmaster at Chadron and trainmaster at Norfolk, Neb., until 1908, when he was advanced to division superintendent at the latter point. In 1922, Mr. Pangle was transferred to Chicago as assistant to the general manager, later serving as assistant to the vice-president, with the same headquarters. In 1925, he returned to Norfolk as assistant general superintendent, Lines West, and in March, 1934, he was promoted to assistant to the president in charge of personnel, with headquarters at Chicago. In 1939, his title was changed to director of personnel.

John E. Hills, assistant superintendent on the Chicago, Milwaukee, St. Paul & Pacific at Montevideo, Minn., has been transferred to Kansas City, Mo., succeeding **R. A. Woodworth,** who has been transferred to Milwaukee, Wis., replacing **R. D. Miller,** who retired on May 15. **J. D. Shea,** trainmaster at Aberdeen, S. D., has been transferred to Montevideo, succeeding to the duties of Mr. Hills, and **R. W. Graves,** fuel inspector, with headquarters at Chicago, has been appointed trainmaster at Aberdeen, relieving Mr. Shea.

Leroy Wyant, signal engineer of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been promoted to superintendent of telegraph and signals, with the same headquarters, succeeding to the duties of **George D. Hood,** superintendent of telegraph, whose retirement on May 1 was announced in the *Railway Age* of April 20. The position of superintendent of telegraph has been abolished. Mr. Wyant was born at Noblesville, Ind., on August 14, 1885, and was educated at Purdue University. In 1909, he entered the signal department of the Rock Island, serving as laborer, wireman and maintainer on automatic block signals until July, 1910. At that time he was transferred to the Chicago Terminal division, where he was employed as maintainer on an electric interlocking plant. He then became a draftsman in the signal engineer's office and later served as an extra gang foreman. On September 1, 1912, he resigned to become a signal supervisor on the Chicago, Indianapolis & Louisville, which position he held until May 1, 1913, when he returned to the signal department of the Rock Island as general signal inspector. In August, 1913, he was promoted to

Leroy Wyant

superintendent of signal construction in charge of the installation of the interlocking plants at Des Moines, Iowa, and Joliet, Ill., and on May 1, 1914, he became assistant signal engineer of the Second and Third districts, with headquarters at Topeka, Kan. Later when these districts were reorganized he was transferred to El Reno, Okla. In 1916 he was transferred as assistant signal engineer to the First district, with headquarters at Des Moines, Iowa. Mr. Wyant was promoted to principal assistant signal engineer in March, 1920, with headquarters in Chicago. In March, 1924, he was appointed acting signal engineer and in March, 1925, returned to his duties as assistant signal engineer. On May 1, 1925, he was advanced to signal engineer, with headquarters at Chicago, the position he held until his recent promotion.

FINANCIAL, LEGAL AND ACCOUNTING

L. C. Gardner, whose appointment as general claim agent of the Norfolk & Western, with headquarters at Roanoke, Va., was announced in the *Railway Age*

L. C. Gardner

of May 11, was born on May 23, 1878, at Newbern, Va. Mr. Gardner attended public and private schools at Newbern, St. Albans Preparatory School at Radford, Va., and Emory & Henry College at Emory, Va. He entered railroad service on February 3, 1905, as clerk in the claim department of the Norfolk & Western. On July 1, 1908, he became claim adjuster at Roanoke, and on February 1, 1909, was transferred to Portsmouth, Ohio. He was promoted to chief clerk in the claim department with headquarters at Roanoke, on May 14, 1913, and on April 1, 1919, became assistant claim agent. On January 1, 1930, he was promoted to assistant general claim agent, which position he relinquished to accept his new position as general claim agent.

TRAFFIC

Tom W. McDonough, district passenger agent on the Canadian National at Edmonton, Alta., has been appointed general agent, passenger department, with headquarters at Jasper Park Lodge and **S. M. Greene,** district passenger agent at Winnipeg, Man., has been transferred to Edmonton, succeeding Mr. McDonough. **M. J. Dupuis,** chief clerk in the passenger

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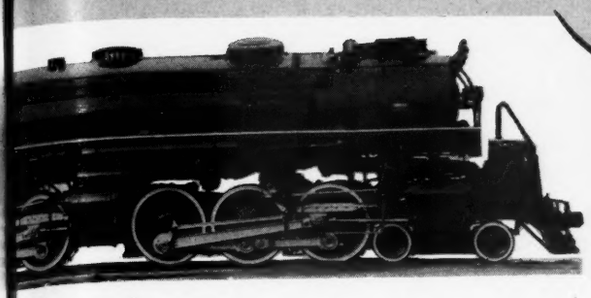

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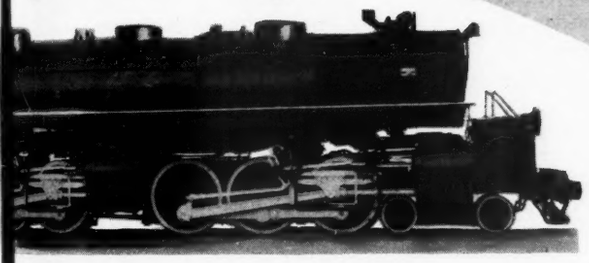

rains today at what, only a few years back, would have been
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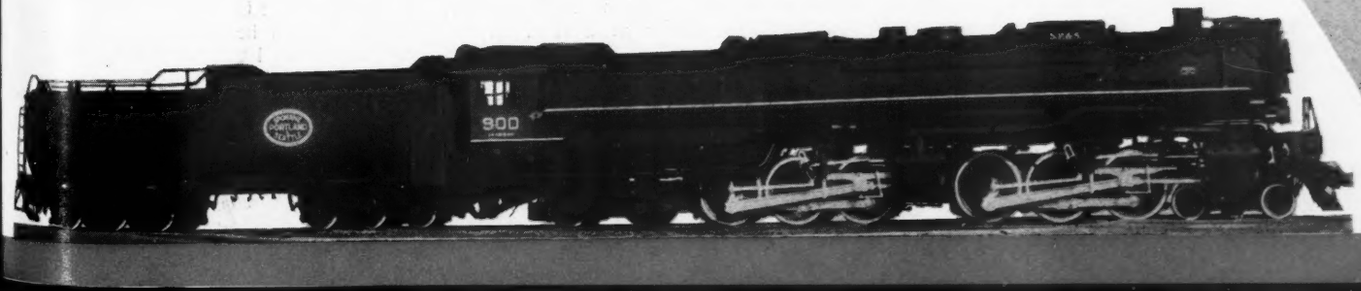


traffic manager's office at Winnipeg, has been promoted to district passenger agent at Manitoba, with headquarters at Winnipeg, replacing Mr. Greene.

D. C. Gough, whose promotion to superintendent on the Canadian National, with headquarters at Kamloops, B. C., was announced in the *Railway Age* of May 11, was born in London, England on January 27, 1888, and entered Canadian National and predecessor companies' service on May 7, 1912, as an instrumentman, subsequently serving as a resident engineer in the construction department and instrumentman in the engineering department at various points, except for the period from 1915 to 1919, when he enlisted and served overseas in the World War, being promoted through various ranks from private to intelligence officer. In April, 1929, he was promoted to roadmaster at Kamloops, B. C., and in August, 1937, he was advanced to assistant superintendent at Kelowna, B. C. Mr. Gough was appointed acting transportation assistant of the Vancouver Island Lines, with headquarters at Victoria, B. C., on May 23, 1939, and on February 1, 1940, he was appointed assistant superintendent at Prince Albert, Sask., the position he held until his recent promotion, which was effective May 1.

W. F. Backus, assistant general freight agent on the New York, Chicago & St. Louis (Nickel Plate), with headquarters at Cleveland, Ohio, has been promoted to general freight agent, rates, with the same headquarters, succeeding **Kenner S. Boreman,** who has been appointed general freight agent at St. Louis, Mo., a newly created position. **John T. Smith,** assistant general freight agent at St. Louis, has retired because of ill health. **F. G. Altenberg,** commercial agent at Erie, Pa., has been promoted to general agent at Cincinnati, Ohio, relieving **Jack J. Wheatley,** who has retired also because of ill health.

Mr. Backus was born at Toledo, Ohio, on August 29, 1893, and entered railway service on November 3, 1908, with the Toledo, St. Louis & Western (now part of the Nickel Plate). In August, 1915, he left railway service to go with the traffic department of the Owens Bottle Company at Toledo and from March, 1918, until April, 1919, he served with the U. S. Navy, returning on the latter date to the Owens Bottle Company. He later went with the traffic department of the Paragon Refining Company, Toledo, and the Paragon Oil Company, Wichita Falls, Tex., and in April, 1920, he returned to the T. St. L. & W. as chief rate clerk and tariff compiler at Toledo. Mr. Backus was transferred to the Nickel Plate at Cleveland, Ohio, in February, 1927, and served thereafter in various capacities and as chief clerk in the tariff bureau and in the general freight department until May 1, 1938, when he was appointed assistant general freight agent at Cleveland, the position he held until his recent promotion.

ENGINEERING AND SIGNALING

Lawrence V. Guild, purchasing agent on the Union Pacific, with headquarters at Salt Lake City, Utah, has been transferred to Portland, Ore., succeeding **George H. Robison,** whose death on February 1 was announced in the *Railway Age* of February 10. **C. E. Galbraith,** chief clerk to the purchasing agent at Omaha, Neb., has been promoted to purchasing agent at Salt Lake City, replacing Mr. Guild.

Laurence V. Johnson, whose promotion to maintenance engineer of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., was announced in the *Railway Age* of May 11, was born at St. Paul, Minn., on April 26, 1906, and attended the University of Minnesota. He entered railway service on the Soo Line in 1928, serving as chief draftsman and later as assistant engineer at Minneapolis, the position he held until his recent promotion, which was effective May 1.

MECHANICAL

L. A. Hartley has been appointed supervisor of apprentices of the Erie, with headquarters at Cleveland, Ohio, succeeding **C. P. Brooks,** who has been promoted to general foreman, locomotive department, at Marion, Ohio, replacing **T. E. Gray,** deceased.

Harry E. Mills, road foreman of engines on the Northern Pacific at Duluth, Minn., has been appointed acting master mechanic, with the same headquarters, succeeding **Norman P. White,** who has been granted a leave of absence because of illness.

The headquarters of **G. M. Lawler,** master mechanic on the Atchison, Topeka & Santa Fe at Dodge City, Kan., have been transferred to LaJunta, Colo., and his jurisdiction will include the roundhouse, locomotive and car departments at La Junta.

Philip Baker, who has been appointed assistant superintendent of motive power of the Lehigh Valley, with headquarters at Sayre, Pa., was born on October 3, 1890, at Nashville, Tenn. Mr. Baker entered railroad service in February, 1907, with the Nashville, Chattanooga & St. Louis as a machinist apprentice. He served as machinist for several railroads in the South, including the Nashville, Chattanooga & St. Louis; St. Louis & San Francisco; Louisville & Nashville; Tennessee Central; Southern; and the Florida East Coast. From 1927 to 1934 he served the Wabash as gang foreman; assistant machine foreman; and assistant master mechanic. In March, 1934, Mr. Baker was appointed general foreman of the Belt Railway of Chicago, subsequently becoming master mechanic, in which capacity he served until his recent appointment on the Lehigh Valley.

PURCHASES AND STORES

L. S. Myers, division storekeeper on the Northern Pacific at Seattle, Wash., has been promoted to assistant general storekeeper, with headquarters at South Tacoma, Wash., succeeding **Frank C. Turner,** whose promotion to general storekeeper, with headquarters at St. Paul, Minn., was announced in the *Railway Age* of April 20.

SPECIAL

George R. Angell, general freight agent on the Chicago, Rock Island & Pacific at Ft. Worth, Tex., has been appointed public relations representative in charge of a new public relations office at Ft. Worth.

OBITUARY

George Gibbs, consulting engineer and expert on railroad electrification, died at Presbyterian hospital, New York, on May 19, after a long illness.

Daniel Willard, Jr., assistant general counsel of the Baltimore & Ohio, and son of it's president, Daniel Willard, died on May 17, at the summer home of his father at Salisbury, Conn. Mr. Willard was born in Minneapolis, Minn., on February 16, 1894. He was graduated from Philips Exeter Academy in 1912 and from Yale in 1916. He entered Harvard Law School but following the entrance of the United States into the World War, Mr. Willard left to join the first Reserve Officers

Daniel Willard, Jr.

Training Corps at Ft. Myer, Va. Commissioned a first lieutenant of artillery, he was assigned to liaison duty with the British and French armies. During his service as an artillery officer in the 26th, or New England division, Mr. Willard was awarded the French Croix de Guerre. In March, 1919, he returned to Harvard Law School, graduating in 1921 with the degree of Bachelor of Legal Letters. He was connected with the firm of Kirlin, Woolsey, Campbell, Hickox and Kentry, New York, from 1921 to 1924, being admitted to the New York Bar in 1922. Mr. Willard entered the service of the Baltimore & Ohio on January 6, 1924, as assistant general attorney and was appointed assistant to general counsel on January 1, 1926. When the Railroad Credit Corporation was organized by the railroads in 1931, he became it's general counsel on leave from the Baltimore & Ohio, later becoming vice-president, with headquarters at Washington, D. C. In 1937, Mr. Willard resumed active work with the Law department of the Baltimore & Ohio and was appointed assistant general counsel on November 17, 1937.

Operating Revenues and Expenses appears on fourth right-hand page

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from 133 Monthly Reports of Revenues and Expenses Representing 137 Class I Steam Railways

(Switching and Terminal Companies Not Included)

FOR THE MONTH OF MARCH, 1940 AND 1939

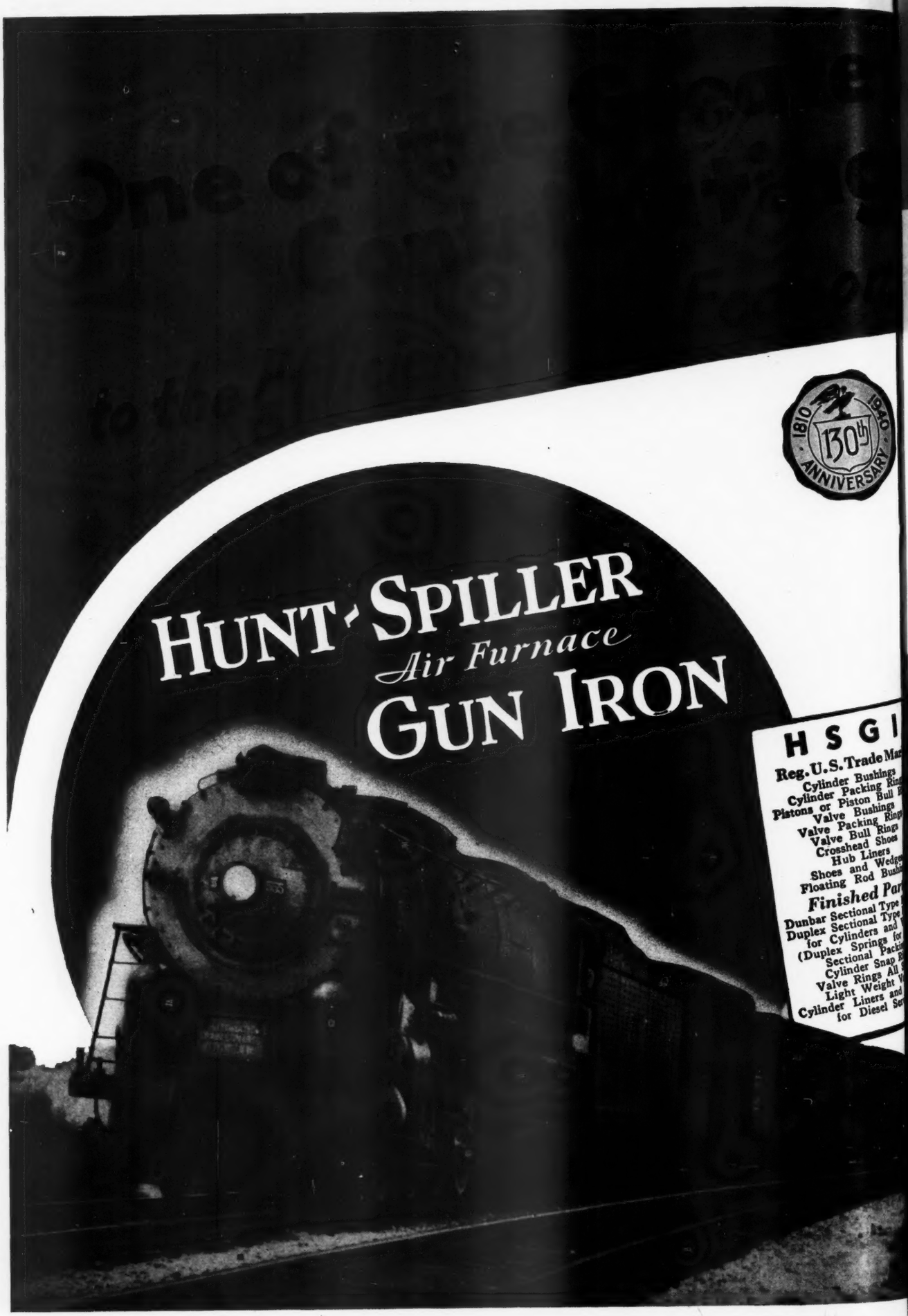
Item	United States		Eastern District		Southern District		Western District	
	1940	1939	1940	1939	1940	1939	1940	1939
Miles of road operated at close of month	232,977	233,618	57,387	57,613	44,350	44,486	131,240	131,519
Revenues:								
Freight	$266,720,709	$257,468,678	$114,016,513	$109,252,182	$56,664,871	$54,015,346	$96,039,325	$94,201,150
Passenger	33,261,946	31,200,518	17,908,827	16,801,565	6,161,273	5,505,111	9,191,846	8,893,842
Mail	8,504,114	8,378,180	3,283,837	3,258,852	1,471,410	1,455,933	3,748,867	3,663,395
Express	5,276,445	5,491,370	2,070,300	2,257,855	1,137,319	1,304,014	2,068,826	1,929,501
All other operating revenues	13,246,024	12,552,271	6,528,705	6,183,646	1,894,240	1,825,246	4,823,079	4,543,379
Railway operating revenues	327,009,238	315,091,017	143,808,182	137,754,100	67,329,113	64,105,650	115,871,943	113,231,267
Expenses:								
Maintenance of way and structures	36,379,734	34,675,291	13,731,134	13,432,558	7,440,349	6,932,554	15,208,251	14,310,179
Maintenance of equipment	66,659,301	65,159,441	29,672,260	28,528,744	13,283,641	12,512,570	23,703,400	24,118,127
Traffic	8,873,855	8,791,950	3,213,240	3,172,664	1,726,002	1,700,783	3,934,613	3,918,503
Transportation—Rail line	122,333,059	117,735,926	56,313,341	53,188,662	21,630,209	20,640,354	44,389,509	43,906,910
Transportation—Water line	527,815	436,132	.....	.....	.....	.....	527,815	436,132
Miscellaneous operations	3,223,162	2,982,071	1,378,140	1,239,974	599,385	512,619	1,245,637	1,229,478
General	10,960,619	10,854,163	4,374,179	4,349,740	2,119,033	2,069,526	4,467,407	4,434,897
Transportation for investment—Cr.	363,535	276,195	137,169	22,971	68,357	44,953	158,009	208,271
Railway operating expenses	248,594,010	240,358,779	108,545,125	103,889,371	46,730,262	44,323,453	93,318,623	92,145,955
Net revenue from railway operations	78,415,228	74,732,238	35,263,057	33,864,729	20,598,851	19,782,197	22,553,320	21,085,312
Railway tax accruals	30,722,526	29,412,781	13,023,660	12,484,344	6,781,398	6,204,113	10,917,468	10,724,324
Railway operating income	47,692,702	45,319,457	22,239,397	21,380,385	13,817,453	13,578,084	11,635,852	10,360,988
Equipment rents—Dr. balance	8,139,549	8,025,432	3,671,621	3,371,900	509,269	802,347	3,958,659	3,851,185
Joint facility rent — Dr. balance	2,818,805	2,918,978	1,573,511	1,625,423	272,410	289,732	972,884	1,003,823
Net railway operating income	36,734,348	34,375,047	16,994,265	16,383,062	13,035,774	12,486,005	6,704,309	5,505,980
Ratio of expenses to revenues (per cent)	76.0	76.3	75.5	75.4	69.4	69.1	80.5	81.4
Depreciation included in operating expenses	17,022,418	16,894,480	7,404,004	7,404,776	3,443,785	3,331,065	6,174,629	6,158,639
Pay roll taxes	9,368,596	8,760,118	4,121,132	3,769,892	1,733,019	1,599,710	3,514,445	3,390,516
All other taxes	21,353,930	20,652,663	8,902,528	8,714,452	5,048,379	4,604,403	7,403,023	7,333,808

FOR THREE MONTHS ENDED WITH MARCH, 1940 AND 1939

Miles of road operated at close of month*	233,023	233,714	57,398	57,630	44,364	44,506	131,261	131,578
Revenues:								
Freight	$807,457,644	$729,100,310	$351,825,371	$310,418,395	$171,849,541	$154,931,722	$283,782,732	$263,750,193
Passenger	101,285,663	96,222,662	54,433,736	52,759,051	18,592,764	16,182,554	28,259,163	27,281,057
Mail	24,284,626	23,673,379	9,264,185	9,082,889	4,245,127	4,165,747	10,775,314	10,424,743
Express	12,027,393	11,786,346	4,568,307	4,469,515	2,757,635	2,965,278	4,701,451	4,351,553
All other operating revenues	40,926,942	36,991,423	20,522,759	18,411,401	5,644,200	5,177,776	14,759,983	13,402,246
Railway operating revenues	985,982,268	897,774,120	440,614,358	395,141,251	203,089,267	183,423,077	342,278,643	319,209,792
Expenses:								
Maintenance of way and structures	103,518,058	96,648,290	41,128,378	38,106,015	21,516,074	19,948,880	40,873,606	38,593,395
Maintenance of equipment	200,603,989	186,226,385	91,260,970	81,458,373	39,701,563	36,076,867	69,641,456	68,691,145
Traffic	26,387,677	25,764,560	9,417,054	9,216,106	5,320,784	5,129,055	11,649,839	11,419,399
Transportation—Rail line	372,791,879	343,546,561	172,760,524	155,496,437	65,769,248	60,056,372	134,262,107	127,993,752
Transportation—Water line	1,553,765	1,183,143	.....	.....	.....	.....	1,553,765	1,183,143
Miscellaneous operations	9,780,217	9,011,799	4,266,659	3,913,258	1,778,820	1,486,139	3,734,738	3,612,402
General	32,583,840	32,145,170	12,969,912	12,940,736	6,294,028	6,069,240	13,319,900	13,135,194
Transportation for investment—Cr.	765,489	600,746	202,962	51,987	160,469	118,489	402,058	430,270
Railway operating expenses	746,453,936	693,925,162	331,600,535	301,078,938	140,220,048	128,648,064	274,633,353	264,198,160
Net revenue from railway operations	239,528,332	203,848,958	109,013,823	94,062,313	62,869,219	54,775,013	67,645,290	55,011,632
Railway tax accruals	91,938,259	86,089,133	38,822,630	35,948,790	20,707,422	18,430,530	32,408,207	31,709,813
Railway operating income	147,590,073	117,759,825	70,191,193	58,113,523	42,161,797	36,344,483	35,237,083	23,301,819
Equipment rents—Dr. balance	24,375,799	23,101,121	11,624,888	10,255,742	1,430,627	1,850,943	11,320,284	10,994,436
Joint facility rent — Dr. balance	8,106,512	8,698,778	4,619,074	4,717,114	619,946	959,624	2,867,492	3,022,040
Net railway operating income	115,107,762	85,959,926	53,947,231	43,140,667	40,111,224	33,533,916	21,049,307	9,285,343
Ratio of expenses to revenues (per cent)	75.7	77.3	75.3	76.2	69.0	70.1	80.2	82.8
Depreciation included in operating expenses	50,716,190	50,422,814	21,949,607	21,948,777	10,272,726	9,981,054	18,493,857	18,492,983
Pay roll taxes	28,090,416	25,213,395	12,522,035	10,920,031	5,184,396	4,588,168	10,383,985	9,705,196
All other taxes	63,847,843	60,875,738	26,300,595	25,028,759	15,523,026	13,842,362	22,024,222	22,004,617

* Represents an average of the mileage reported at the close of each month within the period.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.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ANNIVERSARY
HUNT-SPILLER
Air Furnace
GUN IRON
H S G I
Reg. U.S. Trade Mar
Cylinder Bushings
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Pistons or Piston Bull
Valve Bushings
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Crosshead Shoes
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